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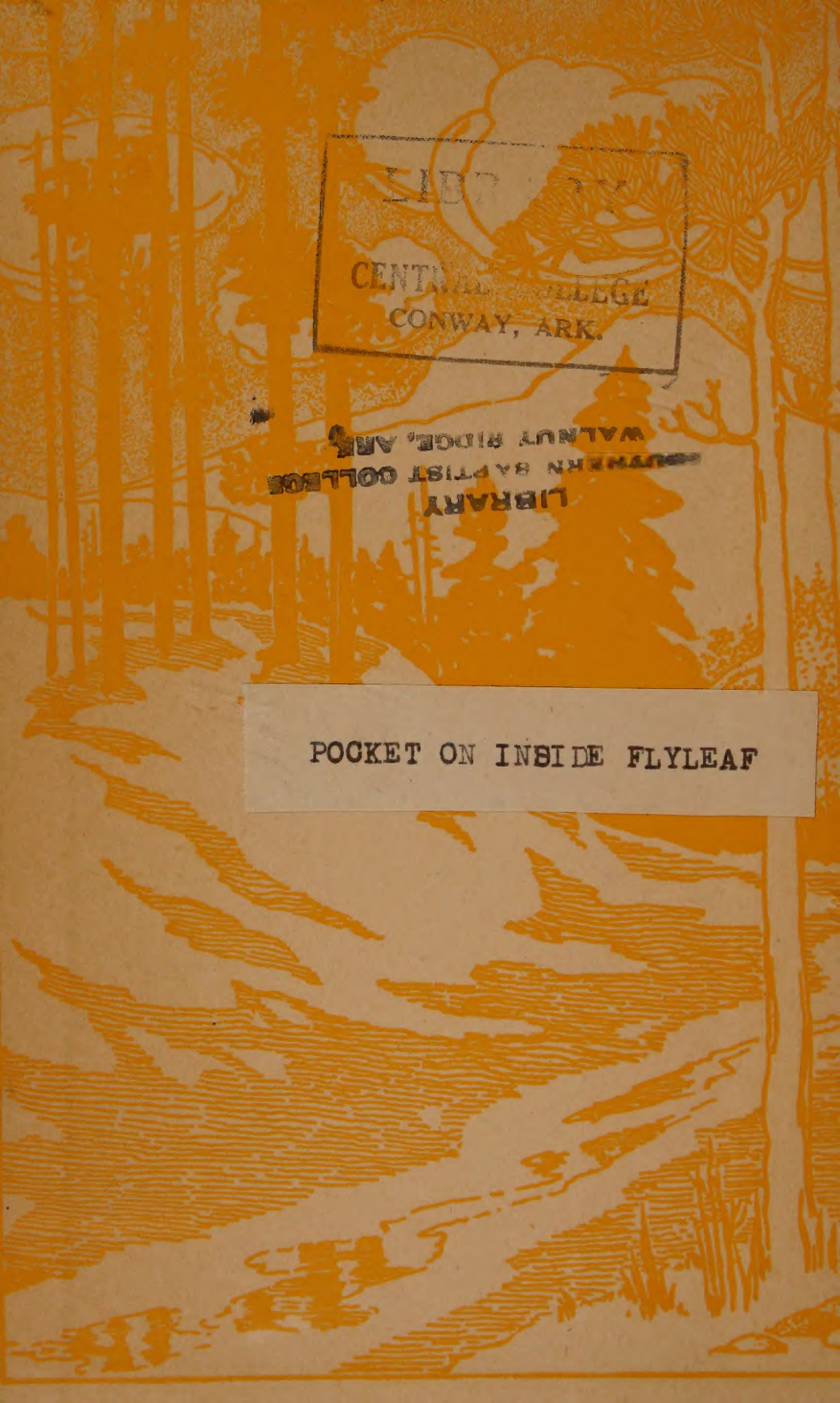
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WATCHED BY WILD ANIMALS

BY
ENOS A. MILLS

WITH ILLUSTRATIONS FROM PHOTOGRAPHS

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TO
ESTHER AND ENDA

PREFACE

IN THE wilds, moving or standing, I was the observed of all observers. Although the animals did not know I was coming, generally they were watching for me and observed me without showing themselves.

As I sat on a log watching two black bears playing in a woods opening, a faint crack of a stick caused me to look behind. A flock of mountain sheep were watching me only a few steps distant. A little farther away a wildcat sat on a log, also watching me. There probably were other watchers that I did not see.

Animals use instinct and reason and also have curiosity—the desire to know. Many of the more wide-awake species do not run panic-stricken from the sight or the scent of man. When it is safe they linger to watch him. They also go forth seeking him. Their keen, automatic, constant senses detect him afar, and stealthily, sometimes for hours, they stalk, follow and watch him.

In the wilderness the enthusiastic, painstaking and skillful observer will see many wild

folks following their daily routine. But, however fortunate he may be, numerous animals will watch him whose presence he never suspects.

Parts of the chapters in this book have appeared in the *Saturday Evening Post*, the *American Boy*, *Field and Stream*, *Munsey's* and *Countryside*. Acknowledgment is hereby made to the editors of these magazines for granting permission to reprint this material.

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Watched By Wild Animals

CHAPTER I

THE ROCKY MOUNTAIN GOAT

AS A flock of wild goats wound in and out among the crevasses and crossed the slender ice bridges of a glacier on Mount Rainier they appeared for all the world like a party of skillful mountain climbers.

Not until I had studied them for a few seconds through my field glasses did I realize that they were goats. There were twenty-seven of them, nannies, billies, and kids, strung out in a crooked line, single file. Once safely across this glacier they lingered to look round. The kids played, the old goats had friendly bouts, and one or two couples scratched each other. After a delay of more than an hour they set off round the mountain and I followed.

While crossing another ice slope they were suddenly subjected to a severe bombardment. A number of large rock fragments crashed down the steep slope, bounding, hurtling, and ripping

the air with terrific speed. The goats were directly in the path of the flying stones, which for a number of seconds bounded over them and struck among them. A small stone struck an old billy on the shoulder and knocked him sliding for some distance. When he regained his feet his shoulder appeared to be broken. Though making every effort to control himself, he continued to slide and presently tumbled into a crevasse. He caught with his good fore foot on the ice and clung for a second, made one desperate attempt to push himself back and almost succeeded, and then fell into the crevasse and disappeared.

A few of the flock watched him, but most of them stood with their heads up the slope facing the wildly bounding stones. None of them ran; there was no confusion, no panic. It was, perhaps, safer for the goats to stand still, thus presenting the smallest target for the flying stones, than to rush forward or to retreat in the midst of the bombardment, for the rocks were coming down both in front and behind them. At any rate, the goat is a wise fellow, and this flock probably had experienced rock fire before. When it was all over the bearded old leader started forward with the rest again following.

Until recently most goats lived in localities

rarely visited either by Indians or by white hunters. As a result, when first shot at they were not excited and were slow to run away. This procrastination of the goat while under fire, together with his supremely crude outlines and slow, awkward actions, led most early hunters and trappers to call him a stupid animal. But he is not at all stupid. Evidence of his alertness and mental development is shown in his curiosity and in his ability to readjust himself promptly to new dangers.

In localities where he was unacquainted with man the goat apparently made no effort to guard against enemies or to use sentinels. But promptly after the coming of hunters and long-range rifles he became extremely wary and sought look-out resting places of safety and had sentinels on duty. He is thoroughly wide-awake at all times. When surprised in close quarters he shows no confusion or panic, and retreats in a masterly manner. If one route of retreat is blocked he starts for another without losing his head. If finally cornered, he makes a stand.

Hunters and dogs cornered an old billy near me in the head of a glacial cirque, in what is now the Glacier National Park. The goat made his stand on slide rock at the bottom of a precipitous wall. He watched for an oppor-

tunity to escape, and made one or two himself. The dogs surged round him. He leaped at one, and with a remarkably quick move of head struck and impaled him on his sharp horns; with a twisting upward toss of the head he ripped and flung him to his death. In rapid succession he killed three dogs. The fourth dog was tossed entirely over a precipice. At this the other dogs drew off.

Finding himself free, the goat did a little desperate rock work to gain a ledge, along which he safely climbed. He stepped accurately, and though the ledge was narrow and covered with small stones there was no slipping and only a few stones fell. The goat defied and defeated this pack of dogs so coolly and easily that I could believe, as I had been told, that he is more than a match for a black bear.

I have never heard of a goat showing any symptoms of fright or fear. Fear with him appears to be a lost trait. It is possible that such a trait may have been detrimental to life in the daily dangers of icy summits and through evolution was long ago eliminated. The goat is decidedly philosophical, makes every movement, meets every emergency with matter-of-fact composure. In all times of danger, and even when dying, he retains mastership of his powers. A mother with a kid, retreating

and heroically fighting off dogs while doing so, impressed me with goat spirit. At last cornered, she kept up the fight, remaining on her feet after she had been struck by several bullets.

The goat often does not die nor does he surrender for some time after receiving a number of fatal wounds, but fights on with telling effectiveness. I imagine he will absorb as many or more bullets, and temporarily survive as long, as any animal in existence. He has the vitality of the grizzly bear. Mountain goats, as the cowboy said of the western horse thieves, "take a lot of killing."

This same day I saw a number of goats abreast coming head foremost down a nearly vertical smooth wall; they had complete composure. They appeared to be putting on brakes with hoofs and dew claws. Loose stones which they occasionally started might have been serious or fatal for one in the lead had they been descending single file. As soon as they reached a ledge at the bottom they stopped to look round, and one of them stood up on hind toes to eat moss from an overhanging rock. Two near-by goats of another flock were limping badly. Possibly they had been struck by flying stones, or they may have been injured by a fall. These two accidents appear to be the

ones most likely to befall this or any other mountain climber.

The white Rocky Mountain goat really is the wild mountain climber. Of all the big animals or the small ones that I know, none can equal him in ascending smooth and extremely precipitous rock walls. That mountain climbing organization of the Pacific Coast which calls itself "Mazama," meaning mountain goat, has an excellent title and one peculiarly fitting for mountain climbers on the icy peaks of the Northwest.

Like all good mountain climbers the goat is sure-footed and has feet that are fit. His stubby black hoofs have a dense, rubbery, resilient broad heel. The outer shell of the hoof is hard, but I think not so hard as the hoofs of most animals.

One season in Alaska I came close upon a party of seven mountain goats in the head of a little cañon. I supposed them cornered and, advancing slowly so as not to frighten them unduly, I thought to get close. They at once made off without any excitement. At a moderate pace they deliberately proceeded to climb what might be called a smooth, perpendicular wall. It leaned not more than ten or twelve degrees from the vertical. There were a few tiny root clusters on it and here and there a

narrow ledge. After a short distance the goats turned to the right, evidently following a cleavage line, and climbed diagonally for two hundred feet. They went without a slip. Most of the time they were climbing two abreast; occasionally they were three abreast. Each, however, kept himself safely away from the others. As they approached the top they climbed single file, old billy leading.

This last climb proved to be the most ticklish part of the ascent. The one leading stood on hind toes with breast pressed close against the cliff and reached up as far as he could with fore feet. He felt of the rocks until he found a good foothold and clinging place, then putting his strength into fore legs literally drew up his body. His hind feet then secured holds and held all gained. Again and again he stood on his toes and reached upward, caught a foothold, and pulled himself up. Just before going over the skyline he reached up with front feet, but apparently found no secure place. He edged along the wall a foot or two to the left and tried, but not satisfied with what he found, edged several feet to the right. Here, squatting slightly, he made a leap upward, caught with his fore hoofs, drew himself up, and stood on the skyline. After two or three seconds he moved on, faced about, and closely watched the

others. Each goat in turn, daringly, slowly, and successfully followed his precipitous course.

John Burroughs says that a fox is a pretty bit of natural history on legs. The mountain goat is just the reverse. I have never seen a big animal which, both in outline and action, is so much the embodiment of stiffness and clumsiness, just block-headed, lumbering wood sections. The fox is alert, keen, quick, agile, slender, graceful, and deft, and looks all these parts.

The goat is a trifle smaller than the mountain sheep. The weight of a full-grown male is about two hundred and fifty pounds. He has a heavy body, high shoulders, and retiring hind quarters; he somewhat resembles a small buffalo. His odd head is attached to a short neck and is carried below the line of the shoulders. He has a long face and an almost grotesque beard often many inches long. The horns are nearly black, smooth, and slender. They grow from the top of the head, curve slightly outward and backward for eight or ten inches, and end in a sharp point. The horns of both sexes are similarly developed and are used by both with equal skill. The goat's hair, tinged with yellow but almost white, is of shaggy length.

In running he is not speedy. His actions

are those of an overfat, aged, and rheumatic dog. He appears on the verge of a collapse. Every jump is a great effort and lands far short of the spot aimed at. Nearly all graceful movements were omitted in his training. Nearly all the actions of this woodeny fellow suggest that a few of his joints are too loose and that most of the others are too tight. He gets up and lies down as though not accustomed to working his own levers and hinges.

Many times I have seen a goat trying in an absurd, awkward manner, after lying down, to remove bumps or stones from beneath him. Holding out one or more legs at a stiff angle, he would claw away with one of the others at the undesired bump. Sometimes he would dig off a chunk of sod; other times a stone or two would be dislodged and pushed out. It seems to be a part of his ways and his habits not to rise to do this, or even to seek a better place. However, an acquaintance with his home territory gives one a friendly feeling for him. After seeing him composedly climbing a pinnacle, apparently accessible only to birds, one begins to appreciate a remarkable coördination of head and foot work.

Although the goat appears clumsy he is the animal least likely to slip, to stumble, to miss his footing or to fall. While the mountain

sheep perhaps excels him in zigzag drop and skip-stop down precipitous places, nothing that I have seen equals the wild goat when it comes to going up slopes smooth and almost vertical. His rock and ice work are one hundred per cent efficient.

When it comes to what you may call durability the goat is in the front ranks. He can climb precipices and pinnacles all day long and in every kind of weather. When not otherwise engaged he plays both on roomy levels and unbanistered precipice fronts. He is ever fit, always prepared. From the viewpoint of many hunters the grizzly bear, the mountain sheep, and the mountain goat are almost in a class by themselves. They exact a high standard of endurance and skill from the hunter who goes after them.

These wild white goats are found only in the mountains of northwestern United States, western Canada, and Alaska where the majority live on high mountain ranges above the timberline. The goat is a highlander. Excepting the few along the northwest coast which come down to near sea level, they live where a parachute would seem an essential part of their equipment.

Many high mountains are more storm-swept than the land of the Eskimo. Storms of sever-

ity may rage for days, making food-getting impossible. But storms are a part of the goat's life; he has their transformed energy. He also has his full share of sunshine and calm. Though up where winter wind and storm roar wildest, he is up where the warm chinook comes again and again and periods of sunshine hold sway. He is fond of sunshine and spends hours of every fit day lying in sunny, sheltered places.

During prolonged storms goats sometimes take refuge in cave-like places among rock ledges or among the thickly matted and clustered tree growths at timberline. But most of the time, even during the colder periods of winter, when the skyline is beaten and dashed with violent winds and stormed with snowy spray, the goat serenely lives on the broken heights in the sky. Warmly clad, with heavy fleece-lined coat of silky wool, and over this a thick, long, and shaggy overcoat of hair, he appears utterly to ignore the severest cold.

The goat thus is at home on the exacting mountain horizon of the world. Glaciers are a part of his wild domain; cloud scenery a part of his landscape. He lives where romantic streams start on their adventurous journeys to mysterious and far-off seas; arctic flowers and old snow fields have place in the heights he ever surveys; he treads the crest of the conti-

nent and climbs where the soaring eagle rests. The majority of goats are born, live, and die on peak or plateau above the limits of tree life.

The goat distinctly shows the response of an animal to its environment. Of course an animal that can live among cañons, ice, and crags must be sure-footed, keen-eyed, and eternally wide awake. He must watch his step and watch every step. Again and again he travels along narrow ridges where dogs would slide off or be blown overboard; he lives in an environment where he is constantly in danger of stepping on nothing or sliding off the icescape. Certain habits and characteristics are exacted from the animal which succeeds on the mountain tops. The goat's rock and ice climbing skill, his rare endurance, and his almost eternal alertness all indicate that he has lived in this environment for ages. His deadly horns and his extraordinary skill in using them show that at times he has to defend himself against animals as well as compete with the elements.

Commonly the Rocky Mountain goat lives in small flocks of a dozen or less, and his home territory does not appear to be a large one. Local goats of scattered territories make a short, semi-annual migratory journey and have different summer and winter ranges, but this appears to be exceptional. They feed upon

the alpine plants, dwarfed willows, and shrubby growths of mountain slopes and summits. They may also eat grass freely.

Bighorn sheep also live above the timberline. In some localities they and the goat are found together. But sheep make occasional lowland excursions, while goats stay close to the skyline crags and the eternal snows, descending less frequently below the timberline except in crossing to an adjoining ridge or peak. Among the other mountain-top neighbours of the goat are ground squirrels, conies, weasels, foxes, grizzly bears, lions, ptarmigan, finches, and eagles; but not all of these would be found together, except in a few localities.

The goat, in common with all the big, wide-awake animals that I know of, has a large bump of curiosity. Things that are unusual absorb his attention until he can make their acquaintance. A number of times after goats had retreated from my approach, and a few times before they had thought to move on, I discovered them watching me, peeping round the corner of a crag or over a boulder. While thus intent they did not appear to be animals with a place in natural history.

In crossing a stretch of icy slope on what is now called Fusillade Mountain, in Glacier National Park, I sat down on the smooth steep

ice to control my descent and bring more bearing surface as a brake on the ice. I hitched along. Pausing on a projecting rock to look round, I discovered two goats watching me. They were within a stone's toss. Both were old and had long faces and longer whiskers, and both were sitting dog fashion. They made a droll, curious appearance as they watched me and my every move with absolute concentration.

I do not know how long the average goat lives. The few hunters who have been much in the goat's territory offer only guesses concerning his age. One told me that he had shot a patriarchal billy that had outlived all of his teeth and also his digestion. The old fellow had badly blunted hoofs and was but little more than a shaggy, skin-covered skeleton.

Although his home is a healthful one, the conditions are so exacting and the winter storms sometimes so long, severe, and devitalizing, that it is probable that the goat lives hardly longer than twelve or fifteen years.

The goat is, I think, comparatively free from death by accidents or disease. Until recently, when man became a menace, he had but few, and no serious, enemies. Being alert and capable among the crags, and in defense of himself exceedingly skillful with his deadly sharp horns,

he is rarely attacked by the lion, wolf, or bear. True, the kids are sometimes captured by eagles.

There are a number of species of wild goats in the Old World—in southern Europe, in many places in Asia and in northern Africa. The white Rocky Mountain goat is the only representative of his species on our continent. He is related to the chamois. Some scientists say that this fellow is not a goat at all, but that he is a descendant of the Asiatic antelope, which came to America about half a million years ago. This classification, however, is not approved by a number of scientists. The Rocky Mountain goat, *Oreamnos montanus*, is in no way related to the American antelope, and it would take a post-mortem demonstration to show the resemblance to the African species.

By any other name he would still be unique. Dressed in shaggy, baggy knickerbockers, he is a living curiosity. I never see one standing still without thinking of his being made up of odds and ends, of a caricature making a ludicrous pretense of being alive and looking solemn. And then I remember that this animal is the mountaineer of mountaineers.

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CHAPTER II

THE HAYMAKER OF THE HEIGHTS

THE first time I climbed Long's Peak I heard a strange, wild cry or call repeated at intervals. "Skee-ek," "Ke-ack," came from among the large rocks along the trail a quarter of a mile below the limits of tree growth. It might be that of bird or beast. Half squeak, half whistle, I had not heard its like. Though calling near me, the maker kept out of sight.

A hawk flew over with a screech not unlike this mysterious "Skee-ek." I had about decided that it was dropping these "Ke-acks" when a rustling and a "Skee-ek" came from the other side of the big rock close by me. I hurried around to see, but nothing was there.

This strange voice, invisible and mocking like an echo, called from time to time all the way to the summit of the peak. And as I stood on the highest point, alone as I supposed, from somewhere came the cry of the hidden caller. As I looked, there near me on a big flat rock sat a cony. He was about six inches

long and in appearance much like a guinea pig; but with regulation rabbit ears he might have passed for a young rabbit. His big round ears were trimmed short.

Rarely do I name a wild animal—it does not occur to me to do so. But as he was the first cony I had seen, and seeing him on top of Long's Peak, I called him almost unconsciously, "Rocky."

Rocky raised his nose and head, braced himself as though to jump, and delivered a shrill "Ke-ack." He waited a few seconds, then another "Skee-ek." I moved a step toward him and he started off the top.

That winter I climbed up to look for a number of objects and wondered concerning the cony. I supposed he spent the summer on the mountain tops and wintered in the lowlands. But someone told me that he hibernated. At twelve thousand feet I heard a "Skee-ek" and then another. An hour later I saw conies sitting, running over the rocks, and shouting all around me—more like recess time at school than hibernating sleep.

One of these conies was calling from a skyline rock thirteen thousand feet above the sea. I walked toward him, wondering how near he would let me come. He kept up his "Skee-eking" at intervals, apparently without noticing

me, until within ten or twelve feet. Then he sort of skated off the rock and disappeared. This was the nearest any cony, with the exception of Rocky on the top of Long's Peak, had ever let me come. His manner of getting off the rock, too, instead of starting away from me in several short runs, made me think it must be Rocky.

The American cony lives on top of the world —on the crest of the continent. By him lives also the weasel, the ptarmigan, and the Bighorn wild sheep; but no other fellow lives higher in the sky than he; he occupies the conning tower of the continent.

But what did these "rock-rabbits" eat? They were fat and frolicking the year around.

The following September I came near Rocky again. He was standing on top of a little haystack—his haystack. All alone he was working. This was his food supply for the coming winter; conies are grass and hay eaters. A hay harvest enables the cony to live on mountain tops.

Rocky's nearly complete stack was not knee-high, and was only half a step long. As I stood looking at him and his tiny stack of hay, he jumped off and ran across the rocks as fast as his short legs could speed him. A dozen or so steps away he disappeared behind a boulder, as though leaving for other scenes.

Photo. by Humphreys Airplane Company

Airplane view of Longs Peak from the east

But he came running back with something in his mouth—more hay. This he dropped against the side of the stack and ran off again behind the boulder.

I looked behind the boulder. There was a small hay field, a ragged space covered with grass and wild flowers, surrounded with boulders and with ice and old snow at one corner. Acres of barren rocks were all around and Long's Peak rose a rocky crag high above.

Back from the stack came the cony and leaped into the field, rapidly bit off a number of grass blades and carrying these in his mouth raced off for the stack. The third time he cut off three tall, slender plant stalks and at the top of one a white and blue flower fluttered. With these stalks crosswise in his teeth, the stalks extending a foot each side of his cheeks, he galloped off to his stack.

Many kinds of plants were mixed in this haystack. Grass blades, short, long, fine, and coarse; large leaves and small; stalks woody and stalks juicy. Flowers still clung to many of these stalks—yellow avens, alpine gentians, blue polemonium, and purple primrose.

The home of Rocky was at approximately 13,000 feet. The cony is found over a belt that extends from this altitude down to 9,500. In many regions timberline splits the cony zone.

In this zone he finds ample dwelling places under the surface between the rocks of slides and moraines.

Conies appear to live in rock-walled, rock-floored dens. I have not seen a cony den in earth matter. With few exceptions all dens seen were among the boulders of moraines or the jumbled rocks of slides. Both these rock masses are comparatively free of earthy matter. Dens are, for the most part, ready-made. About all the cony has to do is to find the den and take possession.

In the remains of a caved moraine I saw parts of a number of cony dens exposed. The dens simply were a series of irregularly connected spaces between the boulders and rock chunks of the moraine. Each cony appears to have a number of spaces for sleeping, hay-stacking, and possibly for exercise. One cony had a series of connected rooms, enough almost for a cliff-dweller city. One of these rooms was filled with hay, and in three others were thin nests of hay.

These dens are not free from danger. Occasionally an under-cutting stream causes a morainal deposit to collapse. Snowslides may cover a moraine deeply with a deposit of snow and this in melting sends down streams of water; the roof over cony rooms leaks badly; he vacates.

Slide rock—the home of the cony—frequently is his tomb. All cliffs are slowly falling to pieces, and occasionally a clinging mass weighing hundreds and possibly thousands of tons lets go and down the slide rock it tumbles, bounding, crushing, and tearing. The conies that escape being crushed come out peeved and protesting against unnecessary disturbances.

One day while crossing the heights there came a roaring and a crashing on the side of a peak that rose a thousand feet above the level of the plateau. A cloud of rock dust rose and filled the air completely for several minutes. As the echoes died away there were calls and alarmed cries of conies. Hastening to the bottom of a slope of slide rock I found scattered fragments of freshly broken rocks. A mass had fallen near the top of the peak and this had crashed down upon the long slope of slide rock, tearing and scattering the surface and causing the entire slope of a thousand feet or more to settle. I could hear a subdued creaking, groaning, and grinding together, with a slight tumble of a fragment on surface.

This slide had been temporarily changed into a rock glacier—a slow, down-sliding mass of confused broken rocks. Its numerous changing subterranean cavities were not safe places for conies.

Numbers of conies were "Skee-eking" and scampering. Weasels were hurrying away from the danger zone. Possibly a number of each had been crushed.

The conies thus driven forth probably found other dens near by, and a number I am certain found welcome and refuge for the night in the dens of conies in undisturbed rocks within a stone's throw of the bottom of the slide.

The upper limits of the inhabited cony zone present a barren appearance. Whether slide or moraine, the surface is mostly a jumble of rocks, time-stained and lifeless. But there are spaces, a few square feet, along narrow ledges or in little wind-blown or water-placed piles of soil, which produce dwarfed shrubs, grasses, and vigorous plants and wild flowers.

Dried food in the form of hay is what enables the cony to endure the long winters and to live merrily in the very frontier of warm-blooded life. In this zone he lives leisurely.

Rocky placed his haystack between boulders, beneath the edge of the big flat rock on which he sat for hours daily, except during hay-making time. As soon as the stack was dry he carried the hay down into his underground house and stacked it in one or more of the rock-walled rooms. It appears that all cony stacks are placed by the entrance of the den, and in

as sheltered a spot as possible. Rocky cut and stacked his hay during September, then early October I saw him carrying it underground.

These cony haystacks were of several sizes and many shapes. The average one was smaller than a bushel basket. I have seen a few that contained twice or even three times the contents of a bushel.

There were rounded haystacks, long and narrow ones, and others of angular shape. But few were of good form, and the average stack had the appearance of a wind-blown trash pile, or a mere heap of dropped hay. Invariably the stack was placed between or to the leeward of rocks; evidently for wind protection.

One stack in a place was the custom. But a number of times I have seen two, four, and once five stacks in collection. Near each stack collection was an equal number of entrances to cony dens.

But little is known concerning the family life of the cony. Nor do I know how long the average cony lives. A prospector in the San Juan Mountains saw a cony frequently through four years. I had glimpses of Rocky a few times each year for three years. During the second summer one of his ears was torn and the slit never united. Just how this happened I do not know.

All conies that I saw making hay were working

alone. But there were five conies at work in one field. One of these haymakers was lame in the left hind foot. Each haycutter carried his load off to his stack. One stack was thirty steps from the field; the one of the lame fellow, fortunately, was only eight steps.

The cony is a relative of the rabbit, the squirrel, the beaver, and the prairie dog. Although he has a home underground, he spends most of his waking hours outdoors. Above ground on a rock he sits—in the sunshine, in cloud, and even in the rain.

Except during harvest, or when seeking a new home, he works but little. Much of the time he simply sits. On a rock that rises two feet or more above the surrounding level he sits by the hours, apparently dreaming.

By the entrance of Rocky's den lay a large, flat slab of granite, several feet long. This was raised upon boulders. He stacked his hay beneath the edge of this outreaching slab and upon the slab he spent hours each day, except in busy haymaking time.

With back against his rock, without a move for an hour or longer, he would sit in one spot near his den. Now and then he sent forth a call as though asking a question, and then gravely listened to the responses of far-off conies. Occasionally he appeared to repeat a

call as though relaying a message from his station. Many of these "Skee-eks" may at times be just common cony talk, while others, given with different speeds and inflections, sometimes are quick and peculiarly accented, and probably warn of possible danger or tell of the approach of something harmless.

One spring day I came by Rocky's place and he was not in sight. I waited long, then laid my sweater upon his slab of granite and went on to the home of another cony. On returning Rocky was home. Like a little watch dog he sat upon the sweater.

Another time in June he was out in the hay meadow eating the short young plants. I stood within ten feet of him and he went on eating as though he did not know I was there. Occasionally he called "Ke-ack" that appeared to be relayed to far-off conies. He did not seem to be watching me but the instant I moved he darted beneath a rock out of sight.

Conies are shy wherever I have found them, and I found many in places possibly not before visited by people.

Rocky's nearest cony neighbour was more than two hundred feet away across the boulders. During a winter visit to him I found cony tracks which indicated that these two conies had exchanged calls.

The cony appears something of a traveller, something of an explorer. A number climb to the summit of the nearest peak during the summer and occasionally one goes far down into the lower lands.

A few times I have seen them as explorers on top of Long's Peak and other peaks that rise above 14,000 feet; and occasionally a cony comes to my cabin and spends a few days looking around, taking refuge, and spending the nights in the woodpile. My cabin is at 9,000 feet, and the nearest cony territory is about a mile up the mountainside.

One snowy day, while out following a number of mountain sheep, I passed near the home of Rocky and turned aside hoping to see him. Before reaching his rock I saw a weasel coming toward me with a limp cony upon his shoulder and clutched by the throat. The weasel saw me and kept on coming toward me, and would, I believe, have brushed by. He appeared in a hurry to take his kill somewhere, probably home.

I threw a large chunk of snow which struck upon a rock by him. He fell off the rock in scrambling over the snow. But he clung to the cony and dragged it out of reach beneath a boulder.

No fur or blood was found on Rocky's rock nor on any of the rocks surrounding his den.

Possibly the cony carried by the weasel was another cony. Just what may have become of Rocky I cannot be sure. Possibly he was crushed by the settling of the rock walls of his house; a fox, eagle, or weasel may have seized him. But at any rate, I never saw him again that I know of, and that autumn no busy little haymaker appeared in the meadow among the boulders.

The weasel is the most persistent and effective enemy of the cony. Evidently he is dreaded by them. Bears, lions, coyotes, foxes, and eagles occasionally catch a cony; but the weasel often does. The weasel is agile, powerful, slender bodied, and can follow a cony into the smaller hiding places of the den and capture him. During winter he is the snow-white ermine, and in white easily slips up over the snow unseen. He can outrun, outdodge a cony, and then, too, he is a trained killer. From the weasel there is no escape for the cony.

During winter rambles in cony highlands I occasionally discovered a stack of hay on the surface. Most stacks are moved into the dens before winter is on.

When a stack is left outside it commonly means that either the stack is exceptionally well sheltered from wind and snow, and in easy and safe reach of the cony, or else the little

owner has lost his life—an avalanche or other calamity forced him to leave the locality.

One sunny morning I set off early on snow-shoes to climb high and to search for the scattered cony haystacks among the rocks on the side of Long's Peak. A haystack sheltered against a cliff was found at timberline. By it was the fresh track of a bighorn ram. He had eaten a few bites of the hay. No other part of the stack had been touched. Around were no cony tracks in the snow. The stack had the appearance of being incomplete. Had a lynx or other prowler captured the haymaker in the unsheltered hayfield? Evidently the owner or builder had not been about for weeks. A slowly forming icicle almost filled the unused entrance to the cony den.

Against the bottom of one large slide of rock was a grassy meadow of a few acres which during summer was covered with a luxuriant growth of grass and wild flowers. Three big stacks of hay stood at the bottom of this slide in a stockade of big rock chunks. The hay was completely sheltered from the wind; from the rich near-by hayfield the stack had been built large. Close to the stacks three holes descended into cony dens.

Had these three near neighbour conies worked together in cutting, carrying, and piling these

three stacks? They were separated by only a few inches and had been cut from one near-by square rod of meadow. But it is likely that each cony worked independently.

Far up the mountainside I found and saw an account of a cony adventure written in the snow. In crossing a barren snow-covered slide I came upon cony tracks coming down. I back-tracked to see where they came from.

A quarter of a mile back and to one side a snowslide mingled with gigantic rock fragments had swept down and demolished a part of a moraine and ruined a cony home. This must have been a week or more before. The snow along the edge of the disturbed area was tracked and re-tracked—a confusion of cony foot-prints.

But the cony making the tracks which I followed had left the place and proceeded as though he knew just where he was going. He had not hesitated, stopped, nor turned to look back. Where was he bound for? I left the wreckage to follow his tracks.

Up over a ridge the tracks led, then down a slope to the place where I had discovered them, then to the left along a terrace a quarter of a mile farther. Here they disappeared beneath huge rocks.

In searching for the tracks beyond I came in

view of a tiny cony haystack back in a cave-like place formed among the rocks. By this was the entrance to a cony den. In the thin layer of snow were numerous cony tracks. To this entrance I traced the cony.

As I stooped, examining things beneath, I heard a cony call above. Edging out of the entrance I saw two conies. They were sitting on the same rock in the sunshine. One probably was the owner of the little haystack—the other the cony from the wrecked home.

CHAPTER III

INTRODUCING MR. AND MRS. SKUNK

A SKUNK expects the other fellow to do the running. Not having much practice he does not have any high speed and puts much awkward effort and action into all speeding.

One September day a skunk came into the grove where I was watching, and stopping by an old log did a little digging. While eating grubs he was disturbed by a falling pine cone. The cone was light, but had a few spots of soft pitch upon it. It stuck to his tail. Greatly disturbed, the skunk thrashed and flounded about until he shook the cone off.

A busy squirrel was harvesting and paying no attention to where his cones were falling. Down came another cone. This landed not behind the skunk but in front. Already troubled, the skunk stuck his tail straight up and struck an attitude of defense.

The skunk had been attending to his own affairs. But after being struck by one cone and threatened with others, I suppose he thought it

time to defend himself. He looked all around, and with stiffly turned neck was trying to see into the tree-tops when another cone came pattering down on the other side of him. This frightened him and at best speed he started in a run out of the grove. Just as he was well into action another squirrel cut off a cone and this bounded and struck near the skunk. He passed me doing his best, and I am sure at record speed for a skunk.

The skunk is ever prepared. So ready is he that bears, lions, or wolves rarely attempt to spring a surprise. I ever tried not to surprise one, but one day a skunk surprised me.

I was edging carefully along a steep, grassy mountainside that was slippery with two or three inches of wet snow. But with all my care both feet suddenly lost traction at once. Out I shot over the slippery slope. As I went I swerved slightly and grabbed for a small bush. A second before landing I saw a skunk behind that bush; he at that instant saw me. The bush came out by the roots and down slid bush, skunk, and myself.

I expected every second that the skunk would attend strictly to business. In the sliding and tumbling I rolled completely over him. But as there was "nothing doing" he must have been too agitated or too busy to go into action.

At just what age the fighting apparatus of a young skunk functions there is no safe way of judging. If an enemy or an intruder appear near a young skunk before his defensive machinery has developed the youngster strikes an impressive attitude, puts up a black-plumed tail, and runs an effective bluff.

I came upon a black bear, who had guessed wrong, just a few minutes after he had charged a pair of young skunks. His tracks showed that he had paused to look at them and do a little thinking before he charged. He had advanced, stopped, stood behind a rock pile and debated the matter. The skunks were young—but just how young? Perhaps he had tasted delicious young skunk, and possibly he had not yet taken a skunk seriously. When I came up he was rubbing his face against a log and had already taken a dive in the brook.

A fox came into the scene where I was watching an entire skunk family. In his extravagantly rich robe he was handsome as he stood in the shadow close to a young skunk. Without seeing the mother, he leaped to seize the youngster. But he swerved in the air as he met the old skunk's acid test. Regardless of his thousand-dollar fur, he rolled, thrashed, and tumbled about in the bushes and in the mud flat by a brook.

A little girl came running toward a house with her arms full of something and calling, "See what cunning kittens I found." She leaped merrily among the guests on the porch, let go her apron, and out dropped half-a-dozen young skunks.

How many times can a skunk repeat? How many acid shots can a skunk throw at an annoyer or an enemy before he is through? was one of my youthful interests in natural history.

Eight times was, so everyone said, the repeating capacity of skunk fire.

One morning while out with two other boys and their dogs it fell to my lot to check up on this.

We came upon a skunk crossing an open field. There was no cover, and in a short time each of our three cur dogs had experienced twice and ceased barking. Each of the boys had been routed. All this time I had dodged and danced about enjoying these exhibitions and skunk demonstrations.

While in action on the dogs and at the boys he had an extraordinary field of range. From one stand, apparently by moving his body, he threw a chemical stream horizontal, then nearly vertical, and then swept the side lines. Far off a tiny solid stream hit in one spot; close up it was a cloud of spray.

When the innocent wood pussy paused after eight performances I felt assured that of course he must be out of eradicator. But he wasn't.

For years I avoided the skunk, the black and white plume-tailed aristocrat. This generally was not difficult; he likes privacy and surrounds himself with an exclusive, discouraging atmosphere.

After a number of chance trial meetings with skunks I found that they were interesting and dependable. From them one knows just what to expect. The skunk attends to his own affairs and discourages familiarity and injustice. He is independent, allows no one to pat him on the back, and no pup to chase him. He is no respecter of persons nor of robes.

For years, I think, the skunk families near my cabin considered me a good neighbour. One mated pair lived near me for three years. These gave me good glimpses of skunk life. Their clothes were ever clean and bright; often in front of the den I stood near while they polished their shining black and white fur. A few times I saw the old ones carry grasshoppers and mice into the den for the waiting little ones. A few times I saw the entire family start afield —off for a hunt or for fun.

The last time I saw this pair before the old spruce blew over and ruined their den, both mother and father were out playing with the

children. She was shooing and brushing the little skunks with her tail, and they were trying to grab it. He was on his back in the grass, feet in the air, with two or three youngsters tossing and tumbling about on his kicking feet.

Skunks have a home territory—a locality in which they may spend their lives. The territory over which skunks hunt or ramble for amusement is about a thousand feet in diameter. Rarely were tracks five hundred feet from the dens of the several families near me. But twice a skunk had gone nearly a mile away; both of these were outings, evidently pleasure trips and not hunts.

Once when a Mr. and Mrs. Skunk wandered up the mountainside seeking adventure and amusement I trailed them—read their record in the snow. They climbed more than two thousand feet among the crags and explored more than a mile into the wilderness. They found and ate a part of the contents of a mouse nest. They killed other mice and left these uneaten. This outing was a frolic and not a foraging expedition.

Homeward, Mr. and Mrs. Skunk chose a different route from the one taken in going up the mountain. They travelled leisurely, going the longest way, pausing at one place to play and at another to sit and possibly to doze in the sunshine.

At one point they apparently defended themselves. Coyote tracks behind a log within ten feet of them, their own tracks showing an attitude of defense, and a wild leap and retreat of the coyote—this was the story in the snow.

The majority of my lively skunk experiences were the result of my trying to get more closely acquainted with him. On a number of occasions, however, I was an innocent bystander while some other person had the experience. Then through years of outdoor life I have known skunks to do numerous things of interest in which skunk character and not skunk scent was the centre of interest.

During a night of flooding rain a mother skunk and five tiny skunkies came into the kitchen of a family with whom I was temporarily staying. They probably had been drowned out. Mother skunk was killed and the little ones thrown out the window to die. But father skunk still lived. The next evening when I went in search of the young ones, as I stood looking about, father skunk walked into a bunch of grass and lifted a little skunk out. Taking mouth hold on the back of its neck he carried it a few feet, laid it down, and then picked up another little skunk with it. With the two youngsters hanging from this mouth hold he carried them off into the woods.

An entire family of skunks out on a frolic came unexpectedly upon me. They numbered eight. I was sitting on a log against a pine, and resolved not to move. In front of me the mother stepped upon a thorn, flinched, and lifted her foot to examine it. All gathered about her. As they moved this way and that, in the sunshine then in the shadows, their shiny black and clean white showed as though just scoured and polished. Surely they were freshly groomed for a party.

Without noticing me they began playing, jumping, and scuffling about. Then single file they pursued one another round a tree. In a mass they suddenly started to rush round the pine against which I sat. I saw them vanish behind the northwest quarter but when they swept round the southeast I was not there.

In Montana I was sitting on top of a low cliff looking down into a willow thicket below, when a deer shied from the willows and hurried on. Then a coyote came out mad and sneezing. A squirrel went down to investigate but quickly climbed a pine sputtering and threatening. The unusual ever lured me—appealed to my curiosity—and often this brought adventure plus information. So down into the willows I started. From the side of the cliff I reached an out-thrust limb of a pine, swung out, and let

go to drop just as the ascending air filled with skunk publicity.

It is sometimes difficult to predict correctly what a skunk will do next. At times my skunk neighbours by my cabin prowled forth at night and again it was in daytime. Generally they showed no concern with the movements of birds and animals unless one came close. On other days they would watch the moves of everything within eye range. Hurrying down a mountainside I one day struck a large skunk with my heavy shoe and knocked him senseless. I waited and watched him survive. Seeing me standing by him he rolled over and played possum.

The young skunks stay with the parents for about one year, I think. In the few instances where I had glimpses inside of winter hibernating dens, the entire family was hibernating together. Apparently the young winter with the parents the first year and scatter the following spring.

Gladly I headed for a prospector's cabin in which I was to spend a few days and nights. I was scarcely seated by his fireplace when he went outside to "cut some meat" that hung at the rear of the cabin.

The first thing I knew a big skunk stood in the doorway. He looked my way, then started

matter-of-fact for me. To heighten interest and to introduce suspense nothing equals the presence of a skunk.

With utmost effort I sat tight. It would have taken more effort to try to turn the skunk or to dodge him. But had I known his next move I would have moved first. He sprang into my lap.

It was too late to dodge so I sat still. He stood up and with paws against me began to look me over. I did not care to lift him off, and he did not "scat." I stood up so he would slide off. With a forepaw in my vest pocket he hung on and I did not risk shaking too violently.

Finally, realizing that he must be a pet, I sat down and began to stroke him. He took this kindly and by the time the prospector returned I was at ease.

Not finding any fresh eggs in a hen's nest, a young skunk started playing with a lone china egg. He was so interested that I came close without his noticing me. He rolled the egg over, pawed it about, tapped it with forepaws, and then smelled it. All the time he was comically serious in expression. Then he held the china egg in forepaws above his head; lay down on his back and played with it, using all four feet; rolled it across his stomach and finally

stood up like a little bear and holding the egg against his stomach with forepaws looked it over with a puzzled expression.

The happy adventures of outdoor life never reduce the excess profits of life insurance companies. They lengthen life. Enjoying the sense of smell is one of the enjoyments of the open country; the spice of the pines and perfumes of wild flowers, the chemical pungency of rain, sun, and soil, the mellow aromas of autumn, and the irrepressible odour of the skunk.

The occupants of a city flat had complained for two days of the lack of heat. The janitor fired strong, but the protests continued. The hot air system did not work. The main must be blockaded, so the janitor thrust in the poker and stirred things up. There was a lively scratching inside. A skunk protested then came scrambling out. Instantly a skunk protest was registered in every room, and a protester against skunk air rushed forth from each room.

Indians say that skunk meat is a delicacy. The frequent attempts of lion and coyote to seize him suggest that he is a prize.

An old joke of the prairie is this skunk definition, "A pole cat is an animal not safe to kill with a pole." But the Indians of the North-

west say that a skunk may be so killed and that a sharp whack of a pole across his back paralyzes nerve action—result, no smell.

In a conversation with a Crow Indian he assured me of his ability to successfully kill a skunk with a pole, and also that he was planning to have a fresh one for dinner. I was to eat with him.

He procured a pole and invited me to go along. I told him of my plan to go down stream for the night. He would not hear of it. As I made ready to go his entire family, then a part of the tribe, came to protest as they were planning tomorrow to show me a bear den and a number of young beavers. There was no escape.

Skunk stew was served. I felt more solemn than I appeared, but not wanting to offend the tribe I tried a mouthful of skunk. But there are some things that cannot be done. I tried to swallow it but go down it simply would not. The Indians had been watching me and suddenly burst out in wild laughter and saved me.

I wonder if the clean white forked stripe in the jet black of the skunk's back renders him visible in the night. Does this visibility prevent other animals from colliding with him, and thus prevent the consequences of such collision? The skunk prowls both day and night, and it may be that this distinct black and white

coat is a protection—prevents his being mistaken for some other fellow.

A skunk is easily trapped. He is a dull-witted fellow, and has little strategy or suspicion. So well protected is he against attack, and so readily can he seize upon the food just secured by another, that rarely does he become excited or move quickly. He never seems to hurry or worry.

I do not believe that I ever missed an opportunity to see a skunk close up. Of course I never aimed to thrust myself upon them. But repeatedly I was surprised by them and it took days to get over it.

A brush pile was filled with skunks. When I leaped upon it they rushed forth on every side, stopped, and waited for me to go away. I was in a hurry, and as they refused to be driven farther off I made way for liberty.

Skunks are not bad people; they simply refuse to be kicked around or to have salt placed upon their plumy tails. Sooner or later every animal in a skunk's territory turns his back on the skunk and refuses to have anything to do with him. But the skunk turns first.

The skunk to go into action reverses ends and puts up his tail. Every animal in the woods wonders as he meets a skunk; wonders, "What luck now?" Head he wins or tails the skunk

wins. When a skunk goes into reverse—thus runs the world away.

The desert skunks that I saw were mighty hunters. Two were even willing to pose for a picture by their kills: one had a five-foot rattlesnake; the other a desert rat. There may be hydrophobia skunks, but I have not seen them nor their victims wasting their lives on the desert bare.

Skunk character and habits evidently changed as the skunk evolved his defensive odour to a state of effectiveness. He now is slow and dull witted. Formerly he probably was mentally alert and physically efficient. His relatives the mink, weasel, and otter are of extraordinary powers. While all these have an obnoxious odour, the mink especially, the skunk is the only one who has made it a far-reaching means of defense.

Skunks appear to be of Asiatic origin. They may have come into America across the Siberia-Alaska land bridge a million or so years ago. Fossil skunks ages old are found in fossil deposits in the Western states.

"Hurry," called a trapper with whom I was camping, as he dashed up, seized his tent-fly, and disappeared behind a clump of trees. As it was a perfectly clear evening, this grabbing of a tent-fly and frantically rushing off suggested the possibility of his running amuck. But I

never ask questions too quickly, and this time there was no opportunity.

As I rounded the trees there before me were two fighting skunks being separated by the trapper. Both turned on him for separating them; but he was into the tent-fly and nearly out of range. Again they were at grips and were biting, clawing, and rolling about when the trapper rushed in, caught his shoe beneath them, and with a leg swing threw them hurtling through the air. They dropped splash into the brook. They separated and swam out to different sides of the brook.

The following day a skunk came out of the woods below camp and fed along the brook in the willows, then out across an opening. I watched him for an hour or longer.

At first I thought him a youngster and started to get close to him. But while still at safe range I looked at him through my field glasses and remained at a distance. Yet I am satisfied that he was a youngster, for he allowed a beetle to pinch his nose, ants were swarming all over him before he ceased digging in an ant hill, and a mouse he caught bit his foot.

He dug and ate beetles, ants, grubs from among the grass roots, found a stale mouse, claimed grubs from alongside a stump, and consumed a whole cluster of caterpillars. Then he

started toddling across the open. Here he specialized on grasshoppers. Commonly he caught these with a forepaw. At other times with two forepaws or his teeth.

He did not appear to suspect any danger and did not pause to look around. No other skunks came near. He lumbered back toward the willows and here met the trapper. They stopped and stood facing each other at man's length. The skunk expected him and everything met to retreat promptly or side step and appeared to be surprised that this was not done.

A minute's waiting and the skunk walked by him at regular speed and never looked up.

CHAPTER IV

THE PERSISTENT BEAVER

I SAW a forest fire sweeping down upon the Broken Tree Beaver colony, and I knew that the inhabitants could take refuge in their earthy, fire-proof houses in the water. Their five houses were scattered in the pond like little islands or ancient lake dwellings. A vigorous brook that came down from the snows on Mount Meeker flowed through the pond. Towering spruce trees encircled its shores.

The beavers survived the fiery ordeal, but their near-by and prospective winter food-supply was destroyed. This grove of aspen and every deciduous tree that might have furnished a bark food-supply was consumed or charred by the fire.

Instead of moving, the colony folks spent a number of days clearing the fire wreckage from their pond. With winter near and streams perilously low for travelling, it probably was unwise to go elsewhere and try to build a home and gather a harvest.

One night, early in October, the colonists

gnawed down a number of aspens that had escaped the fire. These were in a grove several hundred feet down stream from the pond. A few nights later they commenced to drag the felled aspens up stream into their pond. This was difficult work, for midway between the grove and the pond was a waterfall. The beaver had to drag each aspen out of the water and up a steep bank and make a portage around the falls.

The second night of this up-stream transportation a mountain lion had lain in wait by the falls. Tracks and marks on the muddy slope showed that he had made an unsuccessful leap for two beavers on the portage. The following morning an aspen of eighty pounds' weight which two beavers had evidently been dragging was lying on the slope. The lion had not only missed, but on the muddy slope he slipped and received a ducking in the deep water-hole below.

Transportation up stream was stopped. The remainder of the felled aspens were piled into a near-by "safety pond." A shallow stream which beavers use for a thoroughfare commonly has in it a safety pond which they maintain as a harbour, diving into it in case of attack. Usually winter food is stored within a few feet of the house, but in this case it was nearly six hundred feet away. In storing it in the safety pond, the

Photo. by Enos A. Mills

Top of Longs Peak from Mount Meeker

Photo. by Enos A. Mills

Mount Ypsilon

beavers probably were making the best of a bad situation.

Two days after the attack from the lion the beavers commenced cutting trees about fifty yards north of their pond. The beavers took pains to clear a trail or log road over which to drag their felled trees to the pond. Two fallen tree trunks were gnawed into sections, and one section of each rolled out of the way. A two-foot opening was cleared through a tongue of willows, and the cuttings dragged into the pond and placed on top of the food-pile.

One morning a number of abandoned cuttings along this cleared way told that the harvesters had been put to flight. No work was done during the three following nights. Tracks in the mud showed that a lion was prowling about.

Pioneer dangers and hardships are the lot of beaver colonists. The history of every old beaver house is full of stirring interest. The house and the dam must have constant care. Forest fires or other uncontrollable accidents may force the abandonment of the colony at a time when the conditions for travelling are deadly, or when travelling must be done across the country. A score may leave the old home, but only a few survive the journey to the new home site.

The Broken Tree colonists continued the harvest by cutting the scattered aspens along the stream above the pond. A few were cut a quarter of a mile up stream. Before these could be floated down into the pond it was necessary to break a jam of limbs and old trees that had collected against a boulder. The beaver gnawed a hole through the jam. One day a harvester who ventured far up a shallow brook was captured by a grizzly bear. During this unfortunate autumn it is probable that others were lost besides these mentioned. Harvest-getting ended by the pond and the stream freezing over. It is probable that the colonists had to live on short rations that winter.

One winter day a beaver came swimming down into the safety pond. I watched him through the ice. He dislodged a small piece of aspen from the pile in the bottom of the pond and with it went swimming up stream beneath the ice. At the bottom of the icy falls I found a number of aspen cuttings with the bark eaten off. While examining these, I discovered a hole or passageway at the bottom of the falls. This tunnel extended through the earth into the pond above. This underground portage route enabled the beavers to reach their supplies down stream.

The fire had killed a number of tall spruces

on the edge of the pond, and their tall half-burned mats swayed threateningly in the wind. One night two of the dead spruces were hurled into the pond. The smaller one had fallen across a housetop, but the house was thick-walled and, being frozen, had sustained the shock which broke the spruce into sections. The other fallen tree fell so heavily upon two of the houses that they were crushed like shells. At least four beavers were killed and a number injured.

Spring came early, and the colonists were no doubt glad to welcome it. The pond, during May and June, was a beautiful place. Grass and wild flowers brightened the shore, and the tips of the spruces were thick with dainty bloom. Deer came up from the lowlands and wild sheep came down from the heights. The woods and willows were filled with happy mating birds. The ousel built and sang by the falls near which it had wintered. Wrens, saucy as ever, and quiet bluebirds and numbers of wise and watchful magpies were about. The Clarke crows maintained their noisy reputation, and the robins were robins still.

One May morning I concealed myself behind a log by the pond, within twenty feet of the largest beaver house. I hoped to see the young beavers. My crawling behind a log was too

much for a robin, and she raised such an ado concerning a concealed monster that other birds came to join in the hubbub and to help drive me away. But I did not move, and after two or three minutes of riot the birds took themselves off to their respective nesting-sites.

Presently a brown nose appeared between the house and my hiding place. As a mother beaver climbed upon one of the spruce logs thrust out of the water, her reflection in the water mingled with spruces and the white clouds in the blue field above. She commenced to dress her fur —to make her toilet. After preliminary scratching and clawing with a hind foot, she rose and combed with foreclaws; a part of the time with both forepaws at once. Occasionally she scratched with the double nail on the second toe of the hind foot. It is only by persistent bathing, combing and cleaning that beavers resist the numerous parasites which thick fur and stuffy, crowded houses encourage.

A few mornings later the baby beavers appeared. The mother attracted my attention with some make-believe repairs on the farther end of the dam, and the five youngsters emerged from the house through the water and squatted on the side of the house before I saw them. For a minute all sat motionless. By and by one climbed out on a projecting stick and

tumbled into the water. The others showed no surprise at this accident.

The one in the water did not mind but swam outward where he was caught in the current that started to carry him over the dam. At this stage his mother appeared. She simply rose beneath him. He accepted the opportunity and squatted upon her back with that expressionless face which beavers carry most of the time. There are occasions, however, on which beavers show expression of fear, surprise, eagerness, and even intense pleasure. The youngster sat on his mother's back as though asleep while she swam with him to the house. Here he climbed off in a matter-of-fact way, as though a ride on a ferry-boat was nothing new to him.

A few weeks later the mother robin who had become so wrought up over my hiding had times of dreadful excitement concerning the safety of her children. If anything out of the usual occurs, the robin insists that the worst possible is about to happen. This season the mother robin had nested upon the top of the beaver house. This was one of the safest of places, but so many things occurred to frighten her that it is a wonder she did not die of heart disease. The young robins were becoming restless at the time the young beavers were active. Every morning, when on the outside of the

beaver house each young beaver started in turn as though to climb to the top, poor Mother Robin became almost hysterical. At last, despite all her fears, her entire brood was brought safely off.

During the summer, a majority of the Broken Tree beavers abandoned the colony and moved to other scenes. A number built a half-mile down stream, while the others, with one exception, travelled to an abandoned beaver colony on the first stream to the north. Overland this place was only half a mile from the Broken Tree, but by water route, down stream to the forks then up the other stream to the colony, the distance was three miles. This was an excellent place to live, and with but little repair an old abandoned dam was made better than a new one. All summer a lone beaver of this colony rambled about. Once he returned to the Broken Tree colony. Finally, he cast his lot with the long-established colony several miles down stream.

Late this summer a huge landslide occurred on the stream above the Broken Tree pond. The slide material blocked the channel and formed a large, deep pond. From this dam of débris and the torn slope from which it slipped came such quantities of sediment that it appeared as though the pond might be filled.

Every remaining colonist worked day and night to build a dam on the stream just above their pond. They worked like beavers. This new pond caught and stopped the sediment. It was apparently built for this purpose.

The colonists who remained repaired only two of the five houses, and between these they piled green aspen and willow for winter food. But before a tree was cut they built a dam to the north of their home. Water for this was obtained by a ditch or canal dug from the stream at a point above the sediment-catching pond. When the new pond was full, a low grassy ridge about twenty feet across separated it from the old one. A canal about three feet wide and from one to two feet deep was cut through the ridge, to connect the two ponds. The aspens harvested were taken from the slope of a moraine beyond the north shore of the new pond. The canal and the new pond greatly shortened the land distance over which the trees had to be dragged, and this made harvesting safer, speedier, and easier.

Occasionally the beavers did daytime work. While on the lookout one afternoon an old beaver waddled up the slope and stopped by a large standing aspen that had been left by the other workers. At the very bottom this tree was heavily swollen. The old beaver took a

bite of its bark and ate with an expressionless face. Evidently it was good, for after eating the old fellow scratched a large pile of trash against the base of the tree, and from this platform gnawed the tree off above the swollen base. While he was gnawing a splinter of wood wedged between his upper front teeth. This was picked out by catching it with the double nails of the second toe on the right hind foot. This aspen was ten inches in diameter at the point cut off. The diameter of trees cut is usually from three to six inches. The largest beaver cutting that I have measured was a cottonwood with a diameter of forty-two inches. On large, old trees the rough bark is not eaten, but from the average tree which is felled for food all of the bark and a small per cent of the wood is eaten. Rarely will a beaver cut dead wood, and only in emergencies will he cut a pine or a spruce. Apparently the pitch is distasteful to him.

One day another beaver cut a number of small aspens and dragged these, one or two at a time, to the pond. After a dozen or more were collected, all were pushed off into the water. Against this small raft the beaver placed his forepaws and swimming pushed it to the food-pile near the centre of the old pond.

At the close of harvest the beavers in Broken

Tree colony pond covered their houses above waterline with mud, which they dredged from the pond around the foundations of their houses. Sometimes this mud was moved in their forepaws, sometimes by hooking the tail under and dragging it between their hind legs. Then they dug a channel in the bottom of the pond, which extended from the houses to the dam. Parallel with the dam they dug out another channel; the excavated material was placed on the top of the dam. They also made a shallow ditch in the bottom of the pond that extended from the house to the canal that united the two ponds.

The following summer was a rainy one, and the pond filled with sediment to the height of the dam. Most of this sediment came from the landslide débris or its sliding place. The old Broken Tree colony was abandoned.

Different from most animals, the beaver has a permanent home. The beaver has a strong attachment, or love, for his old home, and will go to endless work and repeatedly risk dangers to avoid moving away. He will dig canals, build dams, or even drag supplies long distances by land through difficult and dangerous places that he may live on in the old place. Here his ancestors may have been born and here he may spend his lifetime. In most cases, however, a

colony is not continuously occupied this long. A flood, fire, or the complete exhaustion of food may compel him to move and seek a new home.

In abandoning the Broken Tree pond, one set of dwellers simply went up-stream and took possession of the pond which the landslide had formed. Here they gathered supplies and dug a hole or den in the bank but they built no house. An underground tube or passageway connected this den with the bottom of the pond.

The remainder of the colonists started anew about three hundred feet to the north of the old pond. Here a dam about sixty feet long was built, mostly of mud and turf excavated from the area to be filled with water for their pond. They commenced their work by digging a trench and piling the material excavated on the lower side—the beginning of the dam. This ditch was then widened and deepened until the pond was completed. All excavated material was placed upon the dam.

Evidently the site for the house, as well as for the pond, was deliberately selected. The house was built in the pond alongside a spring which in part supplied the pond with water. The supply of winter food was stored in the deep hole from which the material for the house was excavated. The water from the spring checked freezing near the house and the food-

pile, and prevented the ice from troubling the colonists. Beavers apparently comprehend the advantage of having a house close to a spring. This spring commonly is between the main house entrance and the winter food-pile.

Their pond did not fill with sediment. As the waters came entirely from springs they were almost free of sediment. After eighteen years of use there was but a thin covering of sediment on the bottom of the pond. Neither brook nor stream entered this pond. Was this pond constructed in this place for the purpose of avoiding sediment? As beavers occasionally and with much labour build in a place of this kind, when there are other and easier near-by places in which to build, it may be that this pond was placed here because it would escape sediment. This was the founding of the Spruce Tree colony. It is still inhabited.

CHAPTER V

THE OTTER PLAYS ON

A LONG-BODIED, yellow-brown animal walked out of the woods and paused for a moment by the rapids of a mountain stream. Its body architecture was that of a dachshund, with the stout neck and small upraised head of a sea lion. Leaping into the rushing water it shot the rapids in a spectacular manner. At the bottom of the rapids it climbed out of the water on the bank opposite me and stopped to watch its mate. This one stood at the top of the rapids. It also leaped in and joyfully came down with the torn and speeding water. It joined the other on the bank.

Together they climbed to the top of the rapids. Again these daredevils gave a thrilling exhibition of running the rushing water. They were American otter, and this was a part of their fun and play. A single false move and the swift water would have hurled and broken them against projecting rocks. In the third run one clung to the top of a boulder that peeped above the mad, swirling water. The other shot over

its back a moment later and endeavoured in passing to kick it off.

Though I had frequented the woods for years and had seen numerous otter slides, this was the beginning of my acquaintance with this audacious and capable animal whose play habit and individuality so enliven the wilderness.

Play probably is the distinguishing trait of this peculiar animal. He plays regularly—in pairs, in families, or with numbers who appear to meet for this special purpose. Evidently he plays when this is not connected with food getting or mating. He plays in Florida, in the Rocky Mountains, and in Alaska; in every month of the year; in the sunlight, the moonlight, or darkness. The slippery, ever freshly used appearance of bank slides indicates constant play.

The best otter play that I ever watched was staged one still winter night by a stream in the Medicine Bow Mountains. The snowy slide lay in the moonlight, with the shadow of a solitary fir tree across it. It extended about forty feet down a steep slope to the river. The slide had not been in use for two nights, but coasters began to appear about nine o'clock. A pair opened the coasting. They climbed up the slope together and came down singly. No others were as yet in sight. But in a few

minutes fourteen or more were in the play.

Most of the coasters emerged from an open place in the ice over the rapids, but others came down the river over the snow. As the otter population of this region was sparse the attendance probably included the otter representatives of an extensive area. Tracks in the snow showed that four—possibly a family—had come from another stream, travelling over a high intervening ridge four or five miles across. Many may have come twenty miles or farther.

The winter had been dry and cold. The few otters recently seen by daylight were hunting over the snow for grouse and rabbits, far from the stream. Otter food was scarce. Probably many, possibly all, of these merrymakers were hungry, but little would you have guessed it from their play.

It was a merry-go-round of coasters climbing up single file by the slide while coaster after coaster shot singly down. Each appeared to start with a head-foremost vault or dive and to dart downward over the slides with all legs flattened and pointing backward. Each coaster, as a rule, shot straight to the bottom, though a few times one went off at an angle and finished with a roll. A successful slide carried the coaster far out on the smooth ice and occasionally to the farther bank of the river.

After half an hour of coasting all collected at the top of the slide for wrestling contests. A number dodged about, touching, tagging, rearing to clinch and then to roll over. Several exhibitions were occurring at one time. A few times one chased another several yards from the crowd. Once a number stood up in pairs with forepaws on each other's shoulders and appeared to be waltzing. Finally there was a free-for-all mix-up, a grand rush. One appeared to have an object, perhaps a cone, which all the others were after. Then, as if by common consent, all plunged down the slide together. At the bottom they rolled about for a few seconds in merry satisfaction, but only for a few seconds, for soon several climbed up again and came coasting down in pairs. Thus for an hour the play in the frosty moonlight went on, and without cry or uttered sound. They were coasting singly when I slipped away to my campfire.

The otter is one of the greatest of travellers. He swims the streams for miles or makes long journeys into the hills. On land he usually selects the smoothest, easiest way, but once I saw him descend a rocky precipice with speed and skill excelled only by the bighorn sheep. He has a permanent home range and generally this is large. From his den beneath the roots of a tree, near a stream bank or lake shore, he may

go twenty miles up or down stream; or he may traverse the woods to a far-off lake or cross the watershed to the next stream, miles away. He appears to emigrate sometimes—goes to live in other scenes.

These long journeys for food or adventure, sometimes covering weeks, must fill the otter's life with colour and excitement. Swimming miles down a deep watercourse may require only an hour or two. But a journey up stream often to its very source, through cascades and scant water, would often force the travellers out of the channel and offer endless opportunities for slow progress and unexpected happenings. What an experience for the youngsters!

They may travel in pairs, in families or in numbers. The dangers are hardly to be considered. The grizzly bear could kill with a single bite or stroke of paw; but the agility of the otter would discourage such an attack. A pack of wolves, could they corner the caravan, would likely after severe loss feast on the travellers. The only successful attack that I know of was by a mountain lion on a single otter. Yet so efficient is this long-bodied, deep-biting fellow that I can imagine the mountain lion usually avoiding the otter's trail.

The long land journeys from water to water appear to call for the greatest resourcefulness

and to offer all the events that lie in the realm of the unexplored. Between near-by streams and lakes there are regular and well-worn ways. By easy grades these follow mostly open ways across rough country. It is likely that even the long, seldom-used, and unmarked ways across miles of watersheds are otter trails that have been used for ages.

Fortunate folks, these otters, to have so much time, and such wild, romantic regions for travel and exploration! After each exciting time that I have watched them I have searched for hours and days trying to see another outfit of otter explorers. But only a few brief glimpses have I had of these wild, picturesque, adventurous bands.

In all kinds of places, in action for fun or food, frolic or fight, the otter ever gives a good account of himself. He appears to fear only man. Though he may be attacked by larger animals this matter is not heavily on his mind, for when he wants to travel he travels; and he does this, too, both in water and on land, and by either day or night. To a remarkable degree he can take care of himself. Though I have not seen him do so, I can readily believe the stories that accredit this twenty-pound weasel-like fellow with killing young bears and deer, and drowning wolves and dogs.

The otter is a fighter. One day I came upon records in the snow far from the water that showed he had walked into a wild-cat ambush. The extensively trampled snow told that the desperate contest had been a long one. The cat was left dead, and the otter had left two pressed and bloody spaces in the snow where he had stopped to dress his wounds on the way to the river. On another occasion the fierceness of the otter was attested to by two coyotes that nearly ran over me in their flight after an assault on the rear guard of a band of overland otter emigrants.

Probably the only animal that enters a beaver pond that gives the beaver any concern is the otter. One morning I had glimpses of a battle in a beaver pond between a large invading otter and numerous home-defense beavers. Most of the fighting was under water, but the pond was roiled and agitated over a long stretch, beginning where the attack commenced and extending to the incoming brook, where the badly wounded otter made his escape.

Both beaver and otter can remain under water for minutes, and during this time put forth their utmost and most effective efforts. Several times during this struggle the contestants came up where they could breathe. Twice when the otter appeared he was at it with one large bea-

ver; another time he was surrounded by several, one or more of which had their teeth in him. When he broke away he was being vigorously mauled by a single beaver, which appeared content to let him go since the otter was bent on escape. It was an achievement for the otter to have held his own against such odds. The beaver is at home in the water, and, moreover, has terrible teeth and is a master in using them.

Though originally a land animal, the otter is now also master of the water. He has webbed feet and a long, sea lion-like neck, which give him the appearance of an animal especially fitted for water travel. He outswims fish and successfully fights the wolf and the beaver in the water. He still has, however, extraordinary ability on land, where he goes long journeys and defends himself against formidable enemies. There are straggling otters which invade the realm of the squirrel by climbing trees.

The otter is a mighty hunter and by stealth and strength kills animals larger than himself. He is also a most successful fisherman and is rated A1 in water. Here his keen eyes, his speed and quickness enable him to outswim and capture the lightning-like trout. Fish is his main article of diet, but this must be fresh—just caught; he is a fish hog. He also eats crawfish, eels, mice, rabbits, and birds. However, he is

an epicure and wants only the choicer cuts. He never stores food or returns to finish a partly eaten kill. The more abundant the food supply the less of each catch or kill will he eat.

Food saving is not one of his habits, and conservation has never been one of his practices. Though he hunts and travels mostly at night and alone, he is variable in his habits.

Like all keen-witted animals the otter is ever curious concerning the new or the unusual. He has a good working combination of the cautious and the courageous. One day an otter in passing hurriedly rattled gravel against a discarded sardine can. He gave three or four frightened leaps, then turned to look back. He wondered what it was. With circling, cautious advances he slowly approached and touched the can. It was harmless—and useful. He cuffed it and chased it; he played with it as a kitten plays with a ball. Presently he was joined in the play by another. For several minutes they battered it about, fell upon it, raced for it, and strove to be the first to reach it.

The otter is distributed over North America, but only in Alaska and northern Canada does the population appear to have been crowded. In most areas it might be called sparse. In reduced numbers he still clings to his original

territory. That he has extraordinary ability to take care of himself is shown in his avoiding extermination, though he wears a valuable coat of fur. In England he has survived and is still regularly hunted and trapped. Like the fox he is followed with horse and hounds.

Relentless in chase for food and fierce in defense of self or young, yet he is affectionate at home and playful with his fellows. If an old one is trapped or shot the mate seeks the absent one, wandering and occasionally wailing for days. Perhaps they mate for life.

The young, one to four at a birth, are born about the first of May. They are blind for perhaps six weeks. They probably are weaned before they are four months old, but run with the parents for several months. Both parents carry food for the young and both appear devoted to them. As soon as they are allowed to romp or sleep in the sunshine they are under the ever-watchful eye of one of the parents. Woe to the accidental intruder who comes too close. A hawk or owl is warned off with far-reaching snarls and hisses. If high water, landslides, or the near presence of man threatens the youngsters they are carried one at a time to a far-off den.

The hide-and-seek play appears to be the favourite one of the cubs, kits, or pups, as they

are variously called. They may hide behind mother, behind a log, or beneath the water.

The otter has a powerful, crushing bite and jaws that hang on like a vise. A tug-of-war between two youngsters, each with teeth set in the opposite ends of a stick, probably is a good kind of preparation for the future. They may singly or sometimes two at a time ride on mother's back as she swims about low in the water. When they are a little older mother slips from under them, much to their fright and excitement. She thus forces them to learn to swim. Though most habits are likely instinctive they are trained in swimming.

The otter's two or two-and-a-half foot body is carried on four short legs which have webbed and clawed feet. One weighs from fifteen to twenty-five pounds. Clad in a coat of fur and a sheet of fat he enjoys the icy streams in winter. He also enjoys life in the summer. Though with habits of his own he has ways of the weasel and of the sea otter.

He sends forth a variety of sounds and calls. He whistles a signal or chirps with contentment; he hisses and he bristles up and snarls; he sniffs and gives forth growls of many kinds.

His active brain, eternal alertness, keen senses, and agile body gave him a rare equipment in the struggle for existence. He is in

this struggle commonly a conqueror. "Yes," said a lazy but observing trapper one evening by my campfire, "the otter has more peculiarities than any other animal of the wilderness. Concealed under his one skin are three or four kinds of animals." And this I found him. Doubtless there are many interesting unrecorded and unseen customs concerning this inscrutable and half-mysterious animal.

Possibly the otter heads the list in highly developed play habit. Sometimes numbers gather in advance to prepare a place on which to play. The otter slide rivals the beaver dam when wild folks' ways are discussed. It is interesting that this capable animal with a wide range of efficient versatility should be the one that appears to give the most regular attention to play.

CHAPTER VI

THE BIGHORN IN THE SNOW

ONE winter morning an old mountain sheep came down from the heights, through the deep snow, and called at my cabin. We had already spent a few years trying to get acquainted. Most of these slow advances had been made by myself, but this morning he became a real neighbour, and when I opened the door the Master of the Crags appeared pleased to see me. Although many a shy, big fellow among the wild folks had accepted me as a friend, I had not even hoped to have a close enough meeting with a wild bighorn ram to make an introduction necessary for good form.

I stood for a moment just outside the cabin door. The situation was embarrassing for us both; our advances were confusing, but I finally brought about a meeting of actual contact with bighorn. With slowness of movement I advanced to greet him, talking to him all the while in low tones. Plainly his experiences assured him that I was not dangerous, yet at the same

time instinct was demanding that he retreat. For a time I held him through interest and curiosity, but presently he backed off a few steps. Again I slowly advanced and steadily assured him in the universal language—tone—that all was well. Though not alarmed, he moved off at right angles, apparently with the intention of walking around me. I advanced at an angle to intercept him. With this move on my part, he stopped to stare for a moment, then turned and started away.

I started after him at full speed. He, too, speeded, but with snowshoes I easily circled him. He quickly saw the folly of trying to outrun me; and if he did not accept the situation with satisfaction, as I think he did, he certainly took things philosophically. He climbed upon a snow-draped boulder and posed as proudly as a Greek god. Then he stared at me.

Presently he relaxed and showed a friendly interest. I then advanced and formally introduced myself, accompanying my movements with rapid comment and chatter. I asked him if he was glad to be alive, asked his opinion concerning the weather, the condition of his flock, and finally, told him that game preserves was one of my hobbies, and in such refuges I trusted he had a deep interest. All this, while within a few yards of him and in a most

friendly tone; still he remained almost coldly curious.

At last I begged the rare privilege of taking his picture, and as he was not in a place for good picture-taking, I proceeded to drive him to a spot closer to my cabin. To my astonishment he was willingly driven! He went along as though he had often been driven and as though going to a place of which he was fond!

Among scattered pines and willows by my brook I circled him and took a number of photographs. At last I walked up to my bighorn friend, rubbed his back and felt his horns. He was not frightened but appeared to enjoy these attentions, and to seem proud of my association. But, my big speechless fellow, I had the most from your call!

Twice afterward, once in the winter and once mid-summer, he called and came up to me, and with dignified confidence licked salt from my hand.

In both the Sierras and the Rocky Mountains there are numerous flocks of bighorn or wild mountain sheep which have a resident stamping ground above the timberline, at an altitude of 12,000 feet. They appear not to migrate, although they go often into the lowlands; in spring for the earliest green stuff, in summer for salt or for a change, and during the winter

when conditions commend or command such a move. With the coming of a storm or if there is an attack on them, they at once climb high among the crags, up close to where the eagles soar.

The heights thus is the home of wild sheep. The young are born in bare places among the crags and the snowfields. All stand the storms up close to the sky. They are warmly wrapped; their long, coarse outer coat of hair is almost waterproof and defies the cold.

One of my trips as Snow Observer carried me across the wild Continental Divide while the sky was clearing after a heavy snowfall. In climbing to the summit I passed close to three herds of deer that were stranded in deep snow. But the high wind had swept the treeless summit, and in places the snow had been deeply excavated. In other places it had been thrown into massive drifts. On the summit plateau at an altitude of 12,000 feet I rounded a crag and came close upon a flock of mountain sheep in the moorland from which the wind had swept most of the snow. The sheep were bunched, scattered, and a few were lying down. Here in the heights the sheep had already forgotten the storm, while the elk and the deer far down in the wooded slopes were deeply troubled by the snow. With this open place on the moun-

tain top, these hardy dwellers of the summit could long be indifferent to deep snow or to its deliberate melting.

They bunched in the farthest corner of their wind-cleared place and eyed me curiously while I went by. I back-tracked their wallowed trail to the nook in which they had endured the three-day storm. This place was nearly a mile distant, but over most of the way to the snowless pasture the sheep had travelled on the very edge of the plateau, from which wind and gravity had cleared most of the snow. They had stood through the storm bunched closely against a leeward plateau wall several yards below the summit. The snow had eddied down and buried them deeply. It had required a long and severe struggle to get out of this snow and back through it to the summit, as their footmarks and body impressions plainly showed.

This storm was a general one and deeply covered several states. It was followed by two weeks of cold. For several hundred miles along this and other ranges the deer and the elk had a starving time, while the numerous flocks of sheep on summits escaped serious affliction.

Evidently mountain sheep know their range and understand how to fight the game of self-preservation in the mountain snows. The fact that sheep spend their winters on the mountain

summits would indicate that they find a lower death rate and more comfort here than they could find in the lowlands.

The morning I started across Sawtooth Pass the snow was deep. A gray sky and a few lazily falling snowflakes indicated that it might be deepened. And soon the flakes were falling fast and the wind was howling. Only between gusts could I see. But on I went, for it was easier to advance than to retreat.

I passed over the summit only to find the wind roaring wildly on the other side. Abandoning the course of the snow-buried trail, I went with the wind, being extremely careful to keep myself under control lest the breezes boost me over an unexpected cliff. The temperature was a trifle below zero, and I watched nose, fingers, and cheeks to keep them from freezing.

Two violent gusts drove me to shelter beneath a shelving rock. After half a minute a long lull came and the air cleared of snow dust. There within thirty feet of me were a number of mountain sheep. Two were grazing in a space swept bare by the wind. Another was lying down, not in shelter, but out in an exposed place.

Then I caught sight of two lambs and I failed to see what the other sheep were doing. Those lambs! They were in a place where the wind

hit violently, as the bare space around them showed. They were pushing each other, butting their heads together, rearing up on their hind legs. As I watched them another gust came roaring forward; they stopped for a second and then rushed toward it. I caught my last glimpse just as it struck them and they both leaped high to meet it.

I was in the heights when a heavy snow came down and did not drift. It lay deeply over everything except pinnacles and sharp ridges. I made a number of snowshoe trips to see how sheep met this condition. During the storm one flock had stood beneath an overhanging cliff. When the snowfall ceased the sheep wallowed to the precipitous edge of the plateau and at the risk of slipping overboard had travelled along an inch or less wide footing for more than a mile. Where the summit descended by steep slope they ventured out. Steepness and snow weight before their arrival, perhaps with the assistance of their tramplings, had caused the snow at the top to slip. As the slide thus started tore to the bottom it scraped a wide swath free of snow. In this cleared strip the sheep were feeding contentedly.

Snowslides, large and small, often open emergency feeding spaces for sheep. Long snowshoe excursions on the Continental Divide

have often brought me into the presence of mountain sheep in the snow. They are brave, self-reliant, capable, and ever alert for every advantageous opportunity or opening.

One snowy time I searched the heights for hours without finding any sheep. But in descending I found a number upon a narrow sunny ledge that was free from snow; the trampling and the warmth of the sheep probably had helped clear this ledge. Here they could find scanty rations for a week or longer. I could not make out whether they had spent the storm time here or had come to it afterward.

In the heights are numerous ledges and knife-edge ridges on which but little snow can lodge. The cracks and niches of these hold withered grass, alpine plants, and moss, which afford an emergency food supply that often has saved snow-bound sheep.

Sheep are cool-headed fellows, as well befits those who are intimately associated with precipices. But one day, while slowly descending a steep slope, I unintentionally threw a flock into confusion. Bunched and interested, they watched me approach within sixty or seventy feet. I had been close to them before and this time while moving closer I tried to manipulate my camera. An awkward exhibition of a fall resulted. The sheep, lost in curiosity, fled with-

out looking where they leaped. The second bound landed them upon an icy pitch where everyone lost footing, fell, and slid several yards to the bottom of the slope. All regained their feet and in regular form ran off at high speed.

Accidents do befall them. Occasionally one tumbles to death or is crushed by falling stone. Sometimes the weaker ones are unable to get out of deep snow. On rare occasions a mountain lion comes upon them and slays one or several, while they are almost helpless from weakness or from crusted snow. A few times I have known of one or more to be carried down to death by a snowslide.

While the sheep do not have many neighbours, they do have sunny days. Often the heights, for long periods, are sunny and snowless. Sometimes a storm may rage for days down the slopes while the sheep, in or entirely above the upper surface of the storm cloud, do not receive any snow. Among their resident neighbours are the cony, the white weasel, and flocks of rosy finches and white ptarmigan. In these the sheep show no interest, but they keep on the watch for subtle foxes, bob-cats, and lions.

Snowfall, like rainfall, is unevenly distributed. At times a short distance below the snow-piled heights one or both slopes are snowless; at

other times, the summits are bare while the lowlands are overburdened with snow. Sheep appear quickly to discover and promptly to use any advantage afforded by their range.

One snowy winter an almost famished flock of sheep started for the lowlands. Two thousand feet lower the earth in places lay brown and snowless in the sun. Whether this condition led the sheep downward, or whether the good condition of the lowland was unknown to them and they came in desperation, I know not. Already weak, they did not get down to timberline the first day. The night was spent against a cliff in deep snow. The following morning a dead one was left at the foot of the cliff and the others struggled on downward, bucking their way through the deep snow.

In snow the strongest one commonly leads. Sometimes sheep fight their way through snow deeper than their backs. The leading one rears on hind legs, extends front feet, leaps upward and forward, throwing himself with a lunge upon the snow. At an enormous cost of energy they slowly advance.

The flock that fought its way downward from the heights took advantage of outcropping rocks and, down in the woods, of logs which nearly lifted them above the snow. Six of the eleven who left the heights at last reached shal-

low snow where in a forest glade they remained for nearly a month.

One winter five sheep were caught in the lowlands by a deep snow. They had started homeward with the coming of the storm but were fired on by hunters and driven back. Becoming snowbound they took refuge in a springy opening at the bottom of a forested slope. This open spot was not a stone's throw across. It was overspread by outpouring spring water which dissolved most of the snow. Here the sheep remained for several weeks. This place not only afforded a moderate amount of food, but in it they had enough freedom of movement successfully to resist an attack of wolves. Apparently wolves do not attack sheep in their wintry heights. Deer and elk as well as sheep have often made a stand in a springy place of this kind.

Sheep under normal conditions are serene and often playful. There appears to be most play when the flock is united. Commonly they play by twos, and in this play butt, push, feint, jump, and spar lightly with horns, often rising to the vertical on hind legs. If a bout becomes particularly lively the others pause to look on. They give attention while something unusual is doing. One day I saw a flock deliberately cross a snowdrift when they could easily have

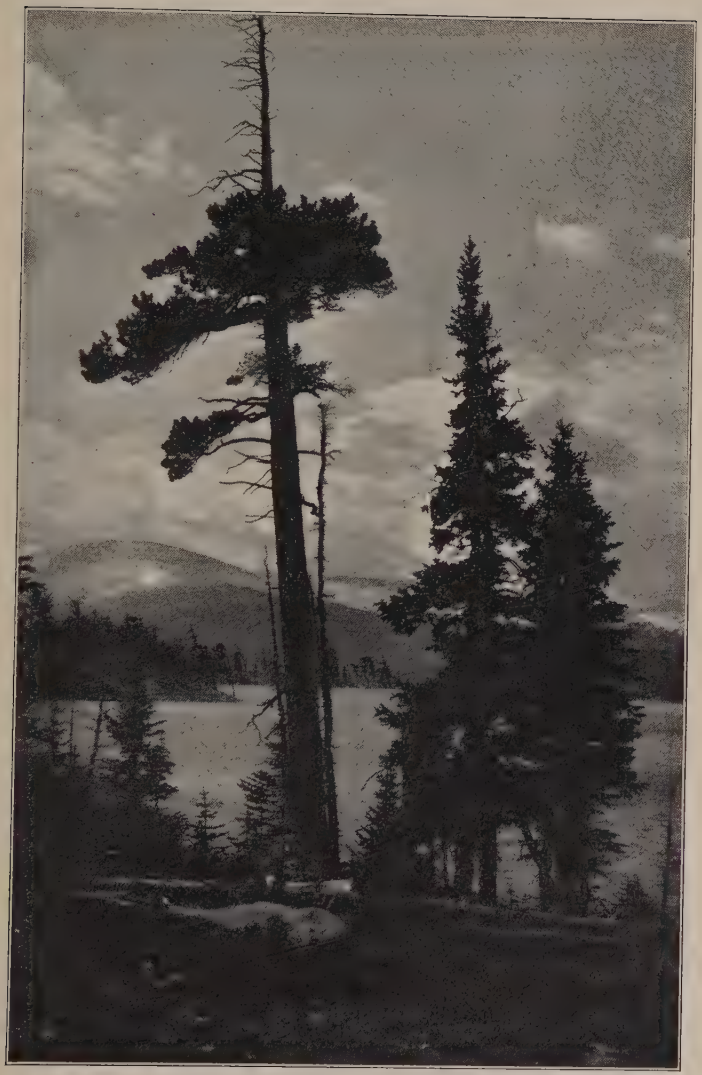


Photo. by Esther B. Mills

Sandbeach Lake in Wild Basin

gone around it. But the sheep were vigorous from good feed and a mild winter and this snowdrift was across the game trail on which they were slowly travelling.

No wild animal grass eater excels the bighorn sheep in climbing skill, alertness, endurance, and playfulness. They thrive on the winds and rations of the heights. Generally the sheep carry more fat when spring comes than the deer that winter down in the shelter of the woods or in the lowlands. Any healthy animal, human or wild, who understands the woodcraft of winter lives happily when drifts the snow.

CHAPTER VII

THE CLOWN OF THE PRAIRIES

NINE healthy coyote puppies were playing in the sunshine with all their might. After days of searching I had at last discovered their den. The puppies had not noticed me and I enjoyed watching their training for the game of life. They wrestled, played at fighting, rolled over and over, bit at one another's feet and tails, and occasionally all mixed in one merry heap.

Their mother came along the hillside above the den. She walked back and forth on the skyline where I could not miss seeing her. Then she came nearer and passed within thirty or forty feet of me. I kept my eyes upon the puppies and pretended not to see their mother. She turned and passed still closer to me. This time she was limping badly on one forefoot and holding up one hind foot. She was making every effort to have me follow her—to lure me away from her home and her puppies.

A moving object down the slope caught the attention of the puppies. As soon as they made

out what this was they scampered racing away. Going only a short distance, they sat down, as though at a dead line. Evidently there is a small zone of safety surrounding the den beyond which the puppies are not allowed to go. At this moment Mr. Coyote appeared, from down the slope, with a jack rabbit in his jaws. He was coming quickly along and had not suspected my presence. How eagerly the puppies watched him! As he came up they commenced snapping and tearing at the rabbit he carried. Mrs. Coyote hastily joined them, and all scurried into the den. The following morning the den was deserted. It is common for coyotes to move their puppies promptly to another den when they think they are discovered.

Another mother coyote decoyed me into watching a vacant den. Her children were in another den a quarter of a mile away. In carrying food to them she went out of her way to enter the vacant den, then left it by a different entrance and proceeded by a circuitous route to the waiting puppies. Both of the old coyotes hunt and carry food to the den for their puppies.

Repeatedly I have seen a mother or a father coyote lure a hunter or trapper away from the den or spot where the young were hidden. I have also seen one or more coyotes stay near a

crippled coyote as though taking care of him, and endeavour to lure away any hunter who approached.

Someone has said that a beautiful coyote hide wraps up more deviltry than any other hide of equal dimensions stretched over an animated form. His successful cunning and his relentless ways of getting a living cause him to be cursed by those whom he plunders. But he is always interesting and appears to enjoy life even in the midst of lean times.

The coyote is the Clown of the Prairie. He is wise, cynical, and a good actor. He has a liking for action and adventure. He really is a happy fellow, something of a philosopher and full of wit.

I have seen a coyote look at a deserted and tumble-down building and strike an attitude of mockery at the failures of man. Sometimes he catches a chicken while the family is away; and, carrying this to the back porch to feast, leaves the unconsumed feathers there. Two nights a coyote raided a settler's hen roost and each time left the feathers near my camp. I was ordered out of the country!

Once I tried for more than half a day to get a picture of a coyote. He appeared to know that I was unarmed and harmless, and allowed me to approach moderately close, but not quite

close enough. At last he lay down by a cliff and pretended to go to sleep. When I came almost near enough to photograph him he rose, looked at me, yawned as though bored, and ran away. A common prank of his is to lure a dog from a camp or ranch to a point where the coyote is safe, then to pounce upon the dog and chase him back in confusion.

As I sat one day on a hillside, watching the antics of calves among a herd of cattle, two coyotes trotted into the scene. They caused no alarm and did not receive even a second look from the cattle. Slowly and knowingly the coyotes walked here and there among them, as though selecting a victim or looking for one whose days were numbered. Near me was a crippled old cow that plainly did not have long to live. The instant the coyotes came within view of her one of them sat down, plainly satisfied with the outlook; and the other laid down with the easy, contemptuous air of a cynic before a waiting feast. To add to the effectiveness of the scene a number of magpies, which usually are watchful enough to arrive first at any promised feast, joined them.

On an Arizona desert I saw two coyotes walking along apparently without any heads. What scheme are they up to now? was my first thought as I stood looking at this magic scene.

But off on the desert was a suspended lake mirage. Two coyotes appeared just beneath the near edge, their heads completely lost in the mirage, their headless bodies walking—a most startling exhibit, even for a desert.

The coyote has a peculiar mental make-up. He has all the keen alertness of the wolf and the audacious cunning of the fox. His fox-like face at times takes on a serio-comic expression. At other times he has a most expectant look as he sits and watches, or listens, with head tilted on one side and sharp ears pointing slightly forward. He has actions, characteristics, and attitudes that make him excel even the fox for the purpose of fable making.

There are numerous Indian myths concerning the coyote; in fact, he takes the place the fox has in primitive European folklore. Numerous tribes pay the coyote tribute in daily food. Their belief accredits him with the audacity and the cunning to seize fire from forbidden sources and deliver this enduring comfort to the fireless red men. Among most Indian tribes he is regarded with favour. Many Indian dogs are descendants of the coyote.

The coyote is a small, fleet-footed, keen-witted animal, tawny or yellowish brown in colour. He is, of course, a wolf; but he is only a little more than half the weight of his large

relative, the gray wolf. Originally he was scattered over most of North America. Though scientifically classified into a number of species and sub-species, they are very much alike in colour and habit.

The home range of the coyote is rarely ten miles across, except on the margin of mountains where sometimes it is twice this. In many localities a pair will have three or four square miles to themselves; in other localities there are a few pairs to the square mile.

Coyotes probably mate for life. A pair commonly hunt together, though each often hunts alone. They are said to live from eight to fifteen years. I kept track of one for eight years, who appeared mature when I first met him and showed no signs of decay when I saw him last.

The coyote usually lies up in a den when not hunting; but at times he simply hides in underbrush or in ravines. A den I measured lay nearly four feet below the surface and had a length of fourteen feet. It was expanded into a room-like place near the farther end and there were a number of small pockets extending from it. The den may be made by the coyotes themselves or it may be the den of a badger which they have re-shaped. Occasionally they take advantage of cave-like places between large

stones. The den commonly is in an out-of-the-way place and the entrance to it is concealed by stones or bushes.

Coyotes often have three or more dens. A change is probably helpful in keeping down parasites, and I am certain that their use of more than one den confuses and defeats their pursuers. Many a man has dug into a coyote's den and found it empty when only the day before he had seen it used by the entire family.

The young are born in April or May, in litters of from five to ten. They grow rapidly and in a few weeks show all the cunning ways and playfulness of puppies. When safe they spend hours outside the den, wrestling, digging, or sleeping in the sun. In two dens I examined each youngster had a separate compartment or pocket for himself; and, judging from claw marks, probably he had dug this himself. In July the youngsters are taken out into the world, where they learn the tactics of wresting a living from the fields.

The coyote is a swift runner and easily outstrips the gray wolf. The average horse cannot catch him and probably the greyhound is the only dog that can overtake him. Swift as he is, however, the jack rabbit and the antelope leave him behind.

Coyotes often hunt in pairs and occasionally

in packs. When hunting in pairs one will leisurely hunt, or pretend to be hunting, in plain view of a prairie dog or other animal. While this active coyote holds the attention of the victim the other slips close and rushes or springs upon it. They often save their legs and their lives with their brains; they succeed by stealth instead of sheer physical endurance.

Antelopes, rabbits, and other animals are frequently captured by several coyotes taking part in the chase. Commonly they scatter in a rude circle and run in relays. Those near the place toward which the animal is running lie in concealment close to its probable course. As the victim weakens all unite to pull it down and are present at the feast.

They are not always successful, however. I have seen jack rabbits break the circle and escape across the prairie. Two pursuing coyotes quickly gave up the race with an antelope when it turned at a sharp angle and struck off at increased speed. A deer, which several coyotes had frightened into running, suddenly stopped in a little opening surrounded by bushes. Here he put up such an effective and successful fight that two of the attackers received broken ribs and the others drew off.

An antelope on the Wyoming plains started several times for water, but, without reaching

it, turned and hurried back to the starting place. Going closer I discovered that she had a young kid with her. This was being watched by a near-by coyote. A part of the time he lay near. If the antelope drove him off he at once returned and paced back and forth dangerously near the kid. Some animal had already secured one of her young, and I fear that the coyote wore the mother out and feasted on the other.

The gray wolf often kills wantonly—kills for fun, when food is not needed. Rarely, I think, does the coyote do this. In times of plenty he becomes an actor and gives plays and concerts; but if fate provides an excess of food he is likely to cache or store it. A miner lost half a sheep from his pack horse. Half an hour later I went along his trail and discovered a coyote burying a part of this, covering it by means of his nose, like a dog. He had eaten to roundness and had nothing in his outlines to suggest the lean wolf.

He eats about everything that has any food value—meat, fruit, grasses, and vegetables in all stages of greenness and ripeness. He has the bad habit of killing young big game; capturing birds and robbing their nests; raiding barnyards for chickens, ducks, and turkeys; and sometimes he feeds on sheep and occasionally kills a calf. Often he catches a fish or frog,

eats roots, tender shoots, or has a feast of fruit or melons.

The coyote is wise enough to keep near the trail and camp of hunters and trappers. Here he gets many a rich meal of camp scraps and cast-off parts of killed animals. I have known him to travel with a mountain lion and to follow the trail of a bear. In certain localities the chipmunks retire in autumn to their holes, fat and drowsy, and temporarily fall into a heavy sleep. Before the earth is frozen they are energetically dug out by the coyotes. But this is only one of the many bits of natural history known and made use of by the coyote.

But the coyote's food habits are not all bad. At some time in every locality, and in a few localities at all times, he has a high rank in economic biology, and may be said to coöperate silently with the settlers in eradicating damaging pests. He is especially useful in fruit-growing sections. He is at the head of the list of mouse-catching animals. He is a successful ratter, and is the terror of prairie dogs, ground squirrels, and rabbits.

If scavengers are helpful, then he is a useful member of society. He has a liking for carcasses, no matter how smelly or ancient. I once saw a coyote feeding on a dead mule along with ravens and buzzards. He did appear

to be a trifle ashamed of his companions; for, though he seeks adventure and is almost a soldier of fortune, he has a pride that does not sanction indiscriminate associates.

He is commonly considered a coward; but this does not appear to be a proper classification of his characteristics. Being shy and cautious is the very price of his existence. He displays both courage and fighting blood whenever there is anything to be gained by such display. Rarely is it cowardly to avoid being a target for the deadly long-range rifle or to slip away from an attack by dogs at overwhelming odds. Recklessness and rashness do not constitute bravery.

The coyote constantly uses his wits. In a Utah desert I often saw him watching the flights of buzzards. If the buzzards came down, the coyote made haste to be among those at the feast. In returning from a far-off expedition on plain or desert he seems to be guided by landmarks; appears to recognize striking objects seen before and to use them as guide posts.

That he is mentally above the average animal is shown in the quickness with which he adjusts himself to changes or to the demands of his environment. If constantly pursued with gun, dogs, and traps he becomes most wary; but if no one in the neighbourhood attempts to swat him

he shows himself at close range, and is often bold.

Near Cañon City, Colorado, an apple grower showed me a three-legged coyote that used his orchard. The coyote had been about for four or five years and was quite tame. He was fed on scraps and was wise enough to stay in the small zone of safety round the house.

But the coyote never forgets. His keen senses and keen wits appear to be always awake, even though surroundings have long been friendly. For a time I stayed at an isolated cattle ranch upon which hunting was forbidden. But one day a man carrying a gun strolled into the field. While he was still a quarter of a mile away the coyotes became watchful and alarmed. To me the appearance of the man and gun differed little from that of the men carrying fishing poles; but the wise coyotes either scented or could distinguish the gun. Presently all hurried away. While the gunner remained, at least one of the coyotes sat where he could overlook the field. But all came strolling back within a few minutes after the gunner left.

In western Wyoming, not far from a ranch house, were three small hills. On these the wolves and coyotes frequently gathered and howled. One day a number of traps were set on each of these hills. That evening the wolves

and coyotes had their usual serenade; but they gathered in the depressions between the hills. Quickly they adjusted themselves to the new conditions, with "Safety first!" always the determining factor.

The coyote has a remarkable voice. It gives him a picturesque part. Usually his spoken efforts are in the early evening; more rarely in early morning. Often a number, in a pack or widely separated, will engage in a concert. It is a concert of clowns; in it are varying and changing voices; all the breaks in the evening song are filled with startling ventriloquistic effects. The voice may be thrown in many directions and over varying distances at once, so that the sounds are multiplied, and the efforts of two or three coyotes seem like those of a numerous and scattered pack.

However, the coyote uses his voice for other things than pleasure. He has a dialect with which he signals his fellows; he warns them of dangers and tells of opportunities; he asks for information and calls for assistance. He is constantly saving himself from danger or securing his needed food by coöperating with his fellows. These united efforts are largely possible through his ability to express the situation with voice and tongue.

Through repetition a coyote's signals are oft-

times relayed for miles. A leader mounts a lonely butte and proclaims his orders over the silent prairie. This proclamation is answered by repeating coyotes a mile or more away. Farther away, at all points of the compass, it is repeated by others. And so, within a fraction of a minute, most of the coyotes within a radius of miles have the latest news or the latest orders.

Sometimes the stratum of air above the prairie is a mellow sounding-board; it clearly and unresistingly transmits these wild wireless calls far across the ravines and hills of the prairie. The clear notes of a single coyote often ring distinctly across a radius of two or three miles. When groups congregate in valley concerts all the air between the near and the far-off hills vibrates with the wild, varying melody. This may reach a climax in a roar like the wind, then break up into a many-voiced yelping.

I love to hear the shoutings and the far-off cries of the coyote. These elemental notes are those of pure gladness and wildness. To me they are not melancholy. Their rollicking concerts remind me of the merry efforts of live boys.

The calls of the coyote have a distinct place in the strangeness and wildness of the Great Plains.

CHAPTER VIII

THE BLACK BEAR—COMEDIAN

A BLACK bear came into a United States Survey camp one Sunday afternoon while all the men were lounging about, and walked into the cook's tent. The cook was averse to bears; he tried to go through the rear of the tent at a place where there was no door. The tent went down on him and the bear. The bear, confused and not in the habit of wearing a tent, made a lively show of it—a sea in a storm—as he struggled to get out.

All were gathered round and watched the bear emerge from beneath the tent and climb a tree. Out on the first large limb he walked. He looked down on us somewhat puzzled and inclined to be playful.

This was at the Thumb in the Yellowstone National Park, in the summer of 1891. I was the boy of the party. For some years I had been interested in wild life, and while in the Park I used every opportunity to study tree and animal life. I frequently climbed trees to examine the fruit they bore, to learn about the insects that

were preying on them or the birds that were eating the insects. I was naturally nicknamed the Tree Climber. There was now a unanimous call for the Tree Climber to go up and get the bear down!

Of course no one wants to climb a tree when it is full of bears. But at last I was persuaded to climb a tree near the one in which the bear reposed and try to rout him out. He had climbed up rapidly head foremost. He went down easily tail foremost. The instant he touched the earth there was such a yelling and slapping of coats that for a time the bear was confused as to whether he should fight or frolic. He decided to climb again. But in his confusion he took the wrong tree. He climbed up beneath me!

From long experience since that time I now realize that the bear simply wanted to romp, for he was scarcely more than one year of age. The black bear is neither ferocious nor dangerous. The most fitting name I have ever heard given him is The Happy Hooligan of the Woods. He is happy-go-lucky, and taking thought of the morrow is not one of his troubles.

The most surprising pranks I ever saw were those of a pet cub. During one of my rambles in the mountains of Colorado I came to the cabin of an eccentric prospector who always

had some kind of a pet. On this occasion it was a black bear cub. The cub was so attached to the place that unchained he stayed or played near by all day while his master was away at work.

With moccasined feet I approached the cabin quietly, and the first knowledge I had of the cub was his spying my approach from behind a tree in the rear of the cabin. He was standing erect, with his body concealed behind the tree; only a small bit of his head and an eye were visible. As I approached him he moved round, keeping the tree between us.

Finally he climbed up several feet; and as I edged round he sidled about like a squirrel, and though always peeking at me, kept his body well concealed on the opposite side of the tree. On my going to the front of the cabin he descended; and when I glanced round the front corner to see him, he was peeking round the rear corner at me.

As I had kept up a lively, pleasant conversation all this time, he evidently concluded that I was friendly, and, like a boy, proceeded to show off. Near by stood a barrel upright, with the top missing. Into this the bear leaped and then deliberately overturned it on the steep slope. Away down hill rolled the barrel at a lively pace with the bear inside. Thrusting

out his forepaws he guided the course of the barrel and controlled its speed.

Once while two black bear cubs were fleeing before a forest fire they paused and true to their nature had a merry romp. Even the threatening flames could not make them solemn. Each tried to prevent the other from climbing a tree that stood alone in the open; round it they clinched, cuffed, and rolled so merrily that the near-by wild folk were attracted and momentarily forgot their fears.

The black bear has more human-like traits than any other animal I know. He is a boy in disguise, will not work long at anything unless at something to produce mischief. Occasionally he finds things dull, like a shut-in boy or a boy with a task to perform, and simply does not know what to do with himself—he wants company.

He is shy and bashful as a child. He plans no harm. He does not eat bad children; nor does he desire to do so. Nothing would give him greater delight than to romp with rollicking, irrepressible children whose parents have blackened his character.

In other words, the black bear is just the opposite in character of what he has long been and still is almost universally thought to be. A million written and spoken stories have it that he

is ferocious—a wanton, cruel killer. He fights or works only when compelled to do so. He is not ferocious. He avoids man as though he were a pestilence.

One day in climbing out on a cliff I accidentally dislodged a huge rock. This as it fell set a still larger rock going. The second rock in its hurtling plunge struck a tree in which a young black bear was sleeping. As the tree came to the earth the bear made haste to scamper up the nearest tree. But unfortunately the one up which he raced had lost its top by the same flying ton of stone, and he was able to get only a few yards above the earth.

To get him to come down I procured a long pole and prodded him easily. At first, on the defensive, he slapped and knocked the pole to right and left. He was plainly frightened and being cornered was determined to fight. I proceeded gently and presently he calmed down and began playing with the pole. He played just as merrily as ever kitten played with a moving, tickling twig or string.

The black bear is the most plausible bluffer I have ever seen. His hair bristling, upper lip stuck forward, and onrushing with a rapid volley of champing K-woof-f-f's, he appears terrible. He pulls himself out of many a predicament and obtains many an unearned morsel

in this way. Most of his bluffs are for amusement; he will go far out of his way for the purpose of running one. In any case, if the bluff is ineffective—and most often it is—he moves on with unbelievable indifference at the failure, and in a fraction of a second is so interested in something else, or so successfully pretends to be, that the bluff might have been yesterday judging from his appearance. Often, like a boy, he has a merry or a terrible make-believe time, in which the bluff is exhibited.

Bears are fond of swimming, and during the summer often go for a plunge in a stream or lake. This is followed by a sunning on the earth or an airing in a treetop.

The grizzly does not climb trees, but the black bear climbs almost as readily as a cat. With its cat-like forepaws it can simply race up a tree trunk. He climbs a small pole or a large tree with equal ease.

The black bear might be called a perching animal. Much of his time, both asleep and awake, is spent in treetops. Often he has a special tree, and he may use this tree for months or even years. When closely pursued by dogs, on the near-by appearance of a grizzly, or if anything startling happen, instantly a black bear climbs a tree. The black bear is afraid of the grizzly.

In case of danger or when leaving on a long foraging expedition the mother usually sends her cubs up a tree. They faithfully remain in the tree until she returns. One day in Wild Basin, Colorado, while watching a mother and two cubs feeding on travelling ants, the mother quietly raised her head then pointed her nose at the cubs. Though there was not a sound the cubs instantly, though unwillingly, started toward the foot of a tree. The mother raised her forepaws as though to go toward them. At that the cubs made haste toward the tree. At the bottom they hesitated; then the mother with rush and champing Whoof! simply sent them flying up the trunk. Then she walked away into the woods.

In the treetop the cubs remained for hours, not once descending to the earth. It was a lodgepole pine sixty or seventy feet away and several feet lower than my stand, on the side of a moraine. For some minutes the cubs stood on the branches looking in the direction in which their mother had disappeared. They explored the entire tree, climbing everywhere on the branches, then commenced racing and playing through the treetop.

At times their actions were very cat-like; now and then squirrel-like; frequently they were very monkey-like; but at all times lively, inter-

esting, and bear-like. Occasionally they climbed and started wrestling far out on a limb. Sometimes they fell off, but caught a limb below with their claws, and without a pause, swung up again or else dropped to another limb. Once they scrambled down the trunk within a few feet of the bottom; and as they raced up again the lower one snapped at the hind legs of the upper one and finally, attaching himself to the other with a forepaw, pulled him loose from the tree trunk. The upper one thus exchanged places with the lower one and the lively scramble up the trunk continued.

After a while one curled up in a place where three or four limbs intersected the tree trunk and went to sleep. The other went to sleep on his back on a flattened limb near the top of the tree.

Realizing that the cubs would stay in the tree, no matter what happened, I concluded to capture them. Though they had been having lively exercise for two hours they were anything but exhausted. Climbing into the tree I chased them round from the bottom to the top; from the top out on limbs, and from limbs to the bottom—but was unable to get within reach of them.

Several times I drove one out on top of a limb and then endeavoured to shake him off and give him a tumble to the earth. A number of

times I braced myself on a near-by large limb and shook with all my might. Often I was able to move the end of the limb rapidly back and forth, but the cubs easily clung on. At times they had hold with only one paw—occasionally with only a single claw; but never could I shake them free.

The affair ended by my cutting a limb—to which a cub was clinging—nearly off with my hatchet. Suddenly breaking the remaining hold of the limb I tossed it and the tenacious little cub out, tumbling toward the earth. The cub struck the earth lightly, and before I had fully recovered from nearly tumbling after him came scrambling up the tree trunk beneath me!

One spring day while travelling in the mountains I paused in a whirl of mist and wet snow to look for the trail. I could see only a few feet ahead. As I looked closely a bear emerged from the gloom heading straight for me. Behind her were two cubs. I caught an impatient expression when she first saw me. She stopped, and with a growl of anger wheeled and boxed the cubs right and left like a worried, unpoised mother. They vanished in the direction from which they had come, the cubs being urged on with lively spanks.

Like most animals, the black bear has a local habitation. His territory is twenty miles or

less in circumference. In this territory he is likely to spend his years, but in springtime he may descend to feed on the earliest wild gardens of the foothills. I have tracked black bears across mountain passes, and on one occasion I found a bear track on the summit of Long's Peak.

The black bear eats everything that is edible, although his food is mainly that of a vegetarian. He digs out rich willow and aspen roots in the shallow and soft places, and tears up numerous plants for their roots or tubers. He eats grass and devours hundreds of juicy weeds. In summer he goes miles to berry patches and with the berries browses off a few inches of thorny bush; he bites off the end of a plum-tree limb and consumes it along with its leaves and fruit.

During summer I have seen him on the edge of snowfields and glaciers consuming thousands of unfortunate grasshoppers, flies, and other insects there accumulated. He is particularly fond of ants—tears ant hills to pieces and licks up the ants as they come storming forth to bite him. He tears hundreds of rotten logs and stumps to pieces for grubs, ants and their eggs. He freely eats honey, the bees and their nests. He often amuses himself and makes a most amusing and man-like spectacle by chasing and catching grasshoppers.

In a fish country he searches for fish and occasionally catches live ones; but he is too restless or shiftless to be a good fisherman. I have seen him catch fish by thrusting his nose in root entanglements in the edge of a brook; sometimes he captures salmon or trout that are struggling through shallow ripples.

Occasionally he catches a rabbit or a bird. But most of his meat is stale, with the killing of which he had nothing to do. He will devour carrion that has the accumulated smell of weeks of corruption. He catches more mice than a cat; and in the realm of economic biology he should be rated as useful. He consumes many other pests.

The black bear is—or was—pretty well distributed over North America. His colour and activities vary somewhat with the locality, this being due perhaps to a difference of climate and food supply.

Everywhere, however, he is very much the same. Wherever found he has the hibernating habit. This is most developed in the colder localities. Commonly he is fat at the close of autumn; and as a preliminary to his long winter rest he makes a temporary nest where for a few days he fasts and sleeps.

With his stomach completely empty he retires into hibernating quarters for the winter.

This place may be dug beneath the base of a fallen tree, close to the upturned roots, or a rude cave between immense rocks, or a den beneath a brush heap. Sometimes he sleeps on the bare earth or on the rocks of a cave; but he commonly claws into his den a quantity of litter or trash, then crawls into this and goes to sleep. The time of his retiring for the winter varies with the latitude; but usually all bears of the same locality retire at about the same date, early December being the most common time.

The grizzly bear is more particular in his choice of sleeping quarters and desires better protection and concealment than the black bear. Bears sometimes come forth in fair weather for a few hours and possibly for a few days. I have known them to come out briefly in mid-winter.

With the coming of spring—anywhere between the first of March and the middle of May—the bears emerge, the males commonly two weeks or more earlier than the females. Usually they at once journey down the mountain. They eat little or nothing for the first few days. They are likely to break their fast with the tender shoots of willow, grass, and sprouting roots, or a bite of bark from a pine.

The cubs are born about mid-winter. Commonly there are three at a birth, but the number varies from one to four. At the time of birth

these tiny, helpless little bears rarely weigh more than half a pound. I suppose if they were larger their mother would not be able to nourish them, on account of having to endure the hibernating fast for a month or so after their birth.

In May, when the cubs and their mother emerge from the dark den, the cubs are most cunning, and lively little balls of fur they are! By this time they are about the weight and size of a cottontail rabbit. In colour they may be black, cinnamon, or cream.

As with the grizzly, the colour has nothing to do with the species. With black bears, however, if the fur is black his claws are also black; or if brown the claws match the colour of the fur. With the grizzly the colour of claws and fur often do not match.

Few more interesting exhibitions of play are to be seen than that of cubs with their mother. Often, for an hour at a time, the mother lies in a lazy attitude and allows the cubs to romp all over her and maul her to their hearts' content.

The mother will defend her cubs with cunning, strength, and utmost bravery. Nothing is more pathetic in the wild world than the attachment shown by the actions of the whimpering cubs over the body of their dead mother. They will struggle with utmost desperation to prevent being torn away from it.

In the majority of cases the mother appears to wean the cubs during the first autumn of their lives. The cubs then den up together that winter. In a number of cases, whenever the cubs are not weaned until the second autumn, they are certain to den up with their mother the first winter. The second winter the young den up together. Though eager for play, brother and sister cubs do not play together after the second summer. When older than two years they play alone or with other bears of the same age.

Young black bears have good tempers and are playful in captivity. But if teased or annoyed they become troublesome and even dangerous with age. If thine enemy offend thee present him with a black bear cub that has been mistreated. He is an intense, high-strung animal, and if subjected to annoyances, teasing, or occasional cruelty, becomes revengeful and vindictive. Sometimes he will even look for trouble, and once in a fight has the tenacity of a bulldog.

Two bears that I raised were exceedingly good-tempered and never looked for trouble. I have known other similar instances. I am inclined to conclude that with uniformly kind treatment the black bear would always have a kind disposition.

For a year or two a dissipated cruiser and his

loyal black bear were familiar figures in the West. The pranks of the bear easily brought drinks enough to enable the cruiser to be drunk most of the time. Many times, when going to my room in the early morning after work on a night shift, I found the cruiser asleep in the street entrance to my lodging house. The faithful bear—Tar Baby—sat by the cruiser's side, patiently waiting for his awakening.

The black bear has a well-developed brain and may be classed among the alert animals of the wild. Its senses are amazingly developed; they seem to be ever on duty. When a possible enemy is yet a mile or so distant they receive by scent or by sound a threatening and wireless message on the moving or through the stationary air. Therefore it is almost impossible to approach closely a wild bear.

With the black bear, as with every living thing, every move calls for safety first; and this exceedingly alert animal is among the very first to appreciate a friendly locality.

The black bear has never been protected as a game animal; through all the seasons of the year, with gun and dogs, the hunter is allowed to pursue him. As he is verging on extinction, and as he gives to the wilds much of its spirit, there ought to be a closed season for a few years to protect this rollicking fellow of the forest.

CHAPTER IX

ON WILD LIFE TRAILS

A SKUNK passed by me going down the trail. In sight was a black bear coming up. Which of these wilderness fellows would give or be forced to give the right-of-way? There must be trail rights. I sat near the trail an innocent and concealed by-stander—a bump on a log—wondering about the wilderness etiquette for the occasion.

The black bear is happy-go-lucky. This one was pre-occupied until within two lengths of the skunk. A three-length side-leap and he stood watchful and ready to escape. The solemn, slow-moving skunk held the right-of-way and passed by without a turn of his head toward the curious and watching black bear. The skunk ever has his own way. His influence is most far reaching.

The wilderness has a web of wild life trails. Many of these are dim. The unobserved of all observers, I often sat in hiding close to a worn, much-trampled wild life trail—a highway —where it crossed a high point.

Before me just at sunrise a grizzly and a

mountain lion met. The grizzly—the dignified master of the wilds—was shuffling along, going somewhere. He saw the lion afar but shuffled indifferently on. Within fifty feet the lion bristled and, growling, edged unwillingly from the trail. At the point of passing he was thirty feet from his trail-treading foe. With spitting, threatening demonstration he dashed by; while the unmoved, interested grizzly saw everything as he shuffled on, except that he did not look back at the lion which turned to show teeth and to watch him disappear.

It was different the day the grizzly met a skunk. This grizzly, as I knew from tracking him, was something of an adventurer. His home territory was more than forty miles to the southeast. He had travelled this trail a number of times. On mere notion sometimes he turned back and ambled homeward.

But this day the grizzly saw the slow-walking skunk coming long minutes before the black and white toddler with shiny plume arrived. The skunk is known and deferred to by wild folk big and little. Regardless of his trail rights the grizzly went on to a siding to wait. This siding which he voluntarily took was some fifty feet from the trail. Here the grizzly finally sat down. He waited and waited for the easy-going skunk to arrive and pass.

The approaching presence of the solemn, slow-going skunk was too much and the grizzly just could not help playing the clown. He threw a somersault; he rolled over. Then, like a young puppy, he sat on an awkwardly held body to watch the skunk pass. He pivoted his head to follow this unhastening fellow who was as dead to humour as the log by the trail.

Along the trail friend meets friend, foe meets enemy, stranger meets stranger, they linger, strangers not again. The meetings may be climaxes, produce clashes, or friendly contact; and in the passing high-brows and common folks rub elbows. To meet or not to meet ever is the question with them.

One old trail which I many times watched was on a ridge between two deep cañons. At the west the ridge expanded into the Continental Divide and the trail divided into dimmer footways. The east end terraced and the trail divided. Stretches of the trail were pine shadowed, spaces were in sunlight.

Where the trail went over a summit among the scattered trees travellers commonly paused for a peep ahead. Often, too, they waited and congested, trampling a wide stretch bare and often to dust. On this summit were scoutings, lingerings, and fighting. Lowlanders and highlanders, singly, in pairs and in strings, stamped the dust

with feet shod in hoofs or in claws and pads.

One of the meetings of two grizzlies which I witnessed was on this ridge trail. A steady rain was falling. Each saw the other coming in the distance and each gave the right-of-way as though accidentally, by showing interest in fallen logs and boulder piles away from the trail. Each ludicrously pretending not to see the other, finally a passing was achieved, the trail regained without a salute.

A meeting of two other grizzlies revealed a different though a common form. Each saw the other coming but each held to the trail. At less than a length apart both rose and roared —feigned surprise—and soundly blamed the other for the narrowly averted and well-nigh terrible collision. But no delay for the last word. Each well pleased with the meeting hastened on, too wise to look back.

One day nothing came along this highway and I looked at the tracks in the wide, dusty trail. The multitude of tracks in it overlapped and overlaid each other. A grizzly track, like the footprint of a shoeless primitive man, was stamped with deer tracks, stitched and threaded with mice tails and tracks and scalloped with wolf toes. But its individuality was there.

For three days I had been a bump on a log by this place and no big travellers had passed.

The birds, chipmunks, and a squirrel were entertaining as ever, but I had hoped for something else. I had just started for camp when dimly through the trees I saw something coming down the trail.

A dignified grizzly and a number of pompous, stiff-necked rams met and were so filled with curiosity that everyone forgot reserve and good form. They stopped and turned for looks at one another and thus merged a rude, serious affair into a slowly passing, successful meeting.

I sometimes sat at a point on this ridge trail so that the passing animal was in silhouette. The background was a lone black spruce against the shifting sky scenery. Horns and whiskers, coats of many colours, and exhibits of leg action went by. Horned heads, short-arched necks, and held-in chins abundantly told of pride and pomposity. But the character topography was in each back line. From nose tip to tail, plateau, cañon, hill, and slope stories stood against the sky.

The tail, though last, was the character clue to the passing figure. Regardless of curve, kink, or incline, it ever was story revealing: sometimes long and flowing, but the short tail attitude incited most imaginative interest in the attached individual.

From treetop I watched one trail where it was crossed by a stream. Generally deer and

sheep went through the stream without a stop. In it bears often rolled. Sometimes they used the wilderness bridge—the beaver dam, and occasionally they splashed through the pond. Coyotes, porcupine, squirrels, rabbits, and lynx used the dam. A porcupine backed a lynx off this into the water, the lynx threatening and spitting. But the lynx met a rabbit near the other end and the rabbit went back with the lynx.

A grizzly was about to cross when three fun-loving grizzly cubs appeared. He stood aside and watched, perhaps enjoyed, their pranks in the water before coming across. On the bank the cubs hesitated for a moment before passing a sputtering squirrel who was denouncing them for youthful pranks. A few inches of the first snow was on the ground. I went back along the trail and examined tracks. At one point a lion had come out of the woods and given the cubs a scare; and still farther back they had stood on hind feet one behind the other, evidently watching a black bear go well around them.

Two flocks of bighorn mountain sheep passed by in single file like two lines of proud, set wooden figures. One of these flocks was down from the heights to visit a far-off salt lick. The other evidently was returning to its local territory on the high range by a circuitous route

after being driven off by hunters. A few days later I saw these flocks meet on a high plateau. They stopped to visit. Then one flock turned back with the other and both edged over to an outlook rim of the plateau where I left them, racing and playing in the on-coming darkness.

In numberless places I saw a single wild fellow meet his species. Two coyotes advanced bristling and passed snarling. Another time two coyotes met, eyed, and then turned off in the woods together. Two wild cats advanced with declaration of war, made the forest aisles hideous with whoops and threats, struck attitudes which go with blood and gore—but nothing happened. Two squirrels approached, each loudly demanding the right-of-way. They blustered, backed-up, threatened, raced tempestuously up and down trees, and finally boastingly passed.

Many a time two rabbits speeded silently by without a slowing, a signal, or a look. Others kicked as they passed. One mid-winter day two rabbits leaped to meet mid-air; then like bucking bronchos they leaped high for action and like miniature mules turned here and there to kick at the target with two feet. If this was fight or frolic only rabbits know.

It often happened that the breeze was favourable and I watched the passing processions from

my camp. Near camp two otters met and turned aside and later I followed their trail to otter slide. Two woodchucks met by a boulder on which I sat quietly. They countermarched in half war-like half circles. A pause, then with apparently friendly negotiations progressing, they discovered a coyote slipping toward them.

Many times through the years I waited for odd hours, and days, at a promising place on a trail a few miles from my cabin. The tracks along this showed it to be in constant use, but never have I seen a traveller pass along it. My being at many a meeting elsewhere was just a coincidence. Years of wilderness wanderings often made me almost by chance an uninvited guest—I was among those present.

Dull fellows well met were skunk and porcupine. These dull-brained but efficiently armed fellows are conceded the right-of-way by conventional wilderness folk. They blundered to head-on clash. Never before had this occurred. Each was surprised and wrathy. There was a gritting of teeth. Each pushed and became furious. Then the skunk received several quills in the side and in turn the porcupine a dash of skunk spray. Both abandoned the trail, sadder but not wiser.

Deer, bear, beavers, and wolves travel be-

cause they need to do so, or for the fun of it. Deer shift for miles from a summer to a winter range, travelling a regular migration route. A number of enemy wolves may follow this moving food supply. Beavers may be seeking a home in new scenes and a bear may be off on an adventure.

Wild life trails were worn by generation after generation of wild animals using the same route, the line of least resistance long followed from one territory to another. Trampling feet assisted by wind and water maintained a plain trail. Indian trails often were wild life trails. Stretches of buffalo trails on the plains and bear trails in Alaska were abandoned because so deeply worn and washed.

From a low cliff by a mountain stream I watched the wild life along the trail on the other side of the stream. The cañon was wooded but the trail immediately opposite was in the open.

Two packs of wolves met on the trail across the river. The leaders rushed to grips and a general mix-up was on. But this was surprisingly brief. There was an outburst of snarling and the gangs passed with but little loss of time and with but one limping.

Often as these travellers passed out of sight after a meeting I wondered what and when

would be their next adventure. Around a turn of the trail within five minutes after the black bear met the skunk he clashed with a lion, so tracks by the trail showed.

I often wondered, too, what experience an animal had been through immediately before he trailed into my sight. The peevish lion was just from her fat, safe, happy kittens. One of the two cross grizzlies was from a row with another grizzly, while the other had been playing along the trail and was on good terms with himself and the world.

When skunk and mink—the more offensive of the smelly family—meet in contest, then smells to heaven their meeting. Driven into a corner, the mink will spread high-power musk in the only avenue of advance. He then is in an impregnable position—no fellow has nose sufficiently strong to pass. Or, if the mink place a guarding circle of musk around a prize kill this makes a time lock and will hold his prize for hours against all comers.

A skunk and mink clashed by the trail across the river. The skunk was leisurely advancing to seize a flopping, misguided trout on the bank when a mink rushed as though to close with the skunk. The skunk hesitated—and lost the fish. The mink in the delay of action made musk screen near the trout. The skunk went

into action and drove the mink off with vile skunk spray. The musk of mink caused his advance to pause, he edged around to the other side, but too much, gave up the fish, and walked off gritting his teeth.

Beavers commonly leave stuffy house and spend summer vacation miles up or down stream. They travel by water. The swift water of a rapids forced two companies of beaver travellers to use the trail of land-lubbers on the bank. Here the company going up visited with another company going down. They mingled, smelled, and rubbed noses. The company going up turned back and both went off to frolic in a beaver pond. Later one company went on down and the other up the stream. Tracks showed that ten left the pond going down; this company had numbered twelve when it met the other company. The up-bound company numbered fourteen at the meeting. Late that day I counted those going up stream as they left the trail and took to the water at the head of the rapids. They had increased their number to sixteen.

Two droves of deer met one October on the trail by stream and a beaver pond. They stopped, mingled, visited, and then laid down together. One drove was migrating from summer range on the peaks and high plateaus to winter range miles

below. It was following along a trail generations old. The other drove was home-seeking. A forest fire with smoke still in the sky had laid barren their home territory.

From my treetop observation tower I saw a single coyote coming, and wondered what would be his attitude concerning the blockading of the trail by superior numbers, and also how these superior numbers would receive a single ancient enemy. But the deer were indifferent to the lone little wolf. They utterly ignored him.

The coyote walked leisurely around the vast assemblage with an air of ownership. Then he sat down before them and eyed them with a display of cynical satisfaction. He turned from this inspection and with a leisurely, contented air walked by with, "I haven't time to-day—but I should worry."

I had my camp by a cliff a short distance up stream and of mornings birds were numerous. A waterfall was at its best in the night. I had planned to watch this place another day or two but the wind was from the wrong quarter—it would carry my scent and warn travellers that a possible killer was in ambush. So I travelled away on this trail.

Many a time in the wilds I "met up" unexpectedly with wild life. And as I recall these meetings I plan again to be among those

present. Unexpected meetings and near meetings were had with most large and leading species of animals on the Continent. The alert grizzly, realizing I was one of the super-killer species, generally avoided me. I travelled alone and unarmed, and before I had satisfied myself that the grizzly is not a ferocious animal I most unexpectedly met one. I was his bogie —both acted on the impulse.

In the wilds one may meet a skunk or a bear. Either gives concentration—one's every-day faculties take a vacation, and the Imagination has the stage. A bear adventure is telling. You meet the bear, he escapes, and eager listeners hear your graphic story.

The skunk is a good fellow—a good mixer. His policy is to meet or be met—the other fellow will attend to the running. The war-filled wilderness of tooth and claw ceases to be aggressive in the pacifying process of the little black and white skunk. When a skunk goes into reverse thus runs the world away. From the met skunk you absorb story material—local colour, carry off enduring evidence; your friends scent the story, they shrink from you; from registered fragments their creative faculties have restored a movie scene.

CHAPTER X

REBUILDING A BEAVER COLONY

IN PASSING the Meadow Beaver Colony one July afternoon I saw an old beaver come up out of the water with a ball of mud in his forepaws. He jammed this mud into a low spot in the dam. Tracks in the mud along the top of this old dam, and a number of green aspen sticks with the bark eaten off lying on the side of the house, showed that a number of beavers had been using this old house and pond for several days.

This was interesting because the place had been abandoned fifteen years before and most of the old beaver works were in ruins. One house, now a mound overgrown with willows, retained its form. The pond it was in had not filled with sediment.

Did this repairing of the dam mean that this old colony was to be resettled by beavers? It probably did, for the beavers ever work for a purpose and not just to be working. It was mid-summer and all beavers who were not making emergency repairs or extensive improvements were off on a summer vacation.

Photo. by Enos A. Mills

A large beaver pond and old house

Photo. by Enos A. Mills

Beaver cut aspen stumps

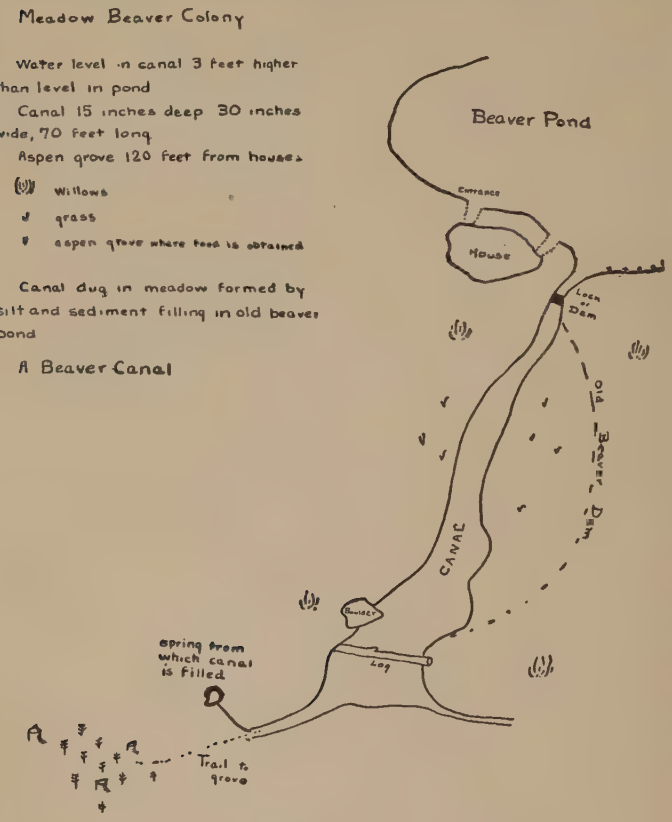
Beavers, like people, occasionally settle in scenes formerly occupied by their kind, and build among the ruins of the long ago. Many a beaver colony, like many an ancient city, has one or more cities buried beneath it.

A few days after seeing the big old beaver at work on the dam I discovered him digging in a canal all alone. Tracks showed that other beavers had been working in the canal, but just why this one was so bold and showed himself during the daytime I could not guess.

That these beavers were at work on a canal left no doubt about their having come to stay. Meantime, the beavers occupied the old house and pond while making this canal and doing other pioneer settlement work. They cleaned it out and patched it up for a temporary camp only.

A canal is one of the best exhibitions of beaver skill. About twenty feet of this canal was finished and it was about three feet wide and eighteen inches deep. It began in the northeast corner of the old pond and was being dug across a filled-in grass-grown pond which had been washed full of mud and sand. It pointed at an aspen grove out in the pines two hundred feet away. It was probable that this canal would be dug as close as possible to the aspen grove, then the canal filled with water from

somewhere and used to float aspen poles down to the beginning—the lower end—of the canal.


Meadow Beaver Colony
Water level in canal 3 feet higher than level in pond
Canal 15 inches deep 30 inches wide, 70 feet long
Aspen grove 120 feet from houses
Willows
grass
aspen grove where food is obtained
Canal dug in meadow formed by silt and sediment filling in old beaver pond
A Beaver Canal
Beaver Pond
Entrance
House
Lower Dam
Old Beaver Dam
CANAL
Ponded
Log
spring from which canal is filled
Trail to grove

And close to the lower end a house was almost certain to be built.

A buried log in the canal was gnawed in two and removed. The canal curved around a

boulder too large to be removed. At a distance of eighty-one feet from the lower end the canal-builders came in contact with granite rock and brought the canal to a stop by enlarging the upper end into a basin about ten feet across.

The entire length of this canal was through the sediment of a former beaver pond. After making a pond beavers must occasionally raise the height of the dam to deepen the water, and also dredge the mud from the bottom. But despite both dredging and dam raising, the pond sooner or later fills with sediment and has to be abandoned. In due time it is overgrown with grass or a forest.

Food shortage—complete exhaustion of the aspen growth—had compelled the abandonment of the Meadow Colony after it had been a beaver settlement for a great many generations. Two large ponds, a dozen smaller ones, and three houses were left to their fate. Most of the smaller ponds were completely lost, being overgrown with willows. Two of the houses had crumbled and were now low wild flower beds.

Since abandonment a number of aspen groves had grown, and although these were some distance from the stream, they could be reached and would furnish necessary food supply.

These settlers had come from about ten miles down stream. During summer vacations beavers make long rambling journeys. It may be that some of these beavers had visited this old colony and knew of its opportunities before coming to settle.

From time to time during evenings I had glimpses of several of the beaver settlers. From their appearance and from their footprints they were mostly young beavers. During the autumn I several times dimly saw them playing in the twilight. They splashed merrily about in the pond, the entire colony taking part.

With mud and willows the beavers repaired the breaks in the but-little-damaged dam of the old pond. Then they cut a ditch thirty or forty feet long through a ridge to a little pond to the north, and filled the old large pond. Its waters extended to within twelve or fifteen feet of the lower end of the canal. But as the canal was nearly two feet higher than the surface of this pond, water for the canal would have to come from a higher source, and I was puzzled as to where this might be. But beavers plan their work two or three moves ahead, and they probably knew what they were about.

Commonly a house is built in the pond or on the edge of it. But on a little space of raised ground, within ten feet of the lower end of the

canal and the edge of the pond, the foundation for a house was being excavated. Two tunnels were made through it to the bottom of the pond.

The house was made of mud dredged from the bottom of the pond, and this was reënforced with an entire clump of willows cut near by. There were also used willow roots, sods, a few stones, and a few peeled aspen sticks off which the beavers had eaten the bark, and which they dragged from their temporary home —the old house.

The finished house was about ten feet across the bottom and five feet high. The walls were about two feet thick. The ventilation top was a mass of criss-crossed sticks without mud.

Beavers do most of their work at night—this probably is for safety from men. It appears that at one time they may have regularly worked during the daytime. But for generations hunters with guns have made day work perilous. In out-of-the-way places where they had not been disturbed I have seen a whole colony at work during the daytime even when the work was not pressing. With exceptions they now work daytime only in emergencies. At this place no one was troubling the beavers and frequently I saw an old one, and at length I realized that it had been the same old one each time.

I was sitting on the side of the beaver house

one afternoon changing a roll of films when the old beaver rose on the pond and swam to a half-submerged log about twenty feet away. I stopped film changing and sat still to watch him. He had not scented me. Splendid reflections he and the surroundings made in the water; the snowy top of Mount Meeker, the blue sky, white clouds, brown willows, green, pointed pines, red birches, and a single young aspen with yellow leaves—a brilliant autochrome of autumn.

The beaver rose from squatting and scratched himself behind a fore leg, combed himself with forepaws, then standing high on his hind feet held forepaws close to his breast and looked around. A fly alighted on his nose. He struck at it. Again it alighted, and he brushed it away with the other forepaw. Again he squatted on the log but facing in the opposite direction. A few minutes later he dived off showing his wide, webbed, gooselike hind feet, and striking the water a heavy, merry whack with his broad black rubbery tail, sending the ripples scurrying over the pond.

The canal still remained empty, but with the completion of the house it would be filled from somewhere and used in bringing in the harvest.

One day late in September I found the canal and the little basin at the south—the upper—

end full of water. A spring concealed among the willows forty feet above had been used. From the spring a small ditch had been dug by the beavers and through this the water was pouring rapidly into the now overflowing canal.

Early one evening, two days later, I peeped through the willows near the south end of the canal and saw an aspen pole with two or three twigs and several leaves fluttering from it. It was moving down the canal toward the house. The old beaver was propelling this. Both forepaws were against the end of the pole and he pushed it speeding toward the house at the lower end of the canal. He left this pole in the water and returned for another, then another.

When he arrived with the third there were two beavers dragging the other poles over the short wet space between the end of the canal and the edge of the pond.

These aspens were being canned in the water —stored in the pond—from which during the winter they would be dragged in short sections up into the house and their bark eaten.

A green aspen commonly water-logs and sinks inside of thirty-six hours. The beavers were simply piling one pole on another, evidently realizing that the sinking would follow.

The following afternoon I saw the old beaver

in the aspen grove gnawing away at a seven-inch aspen. This was nearly cut off. In giving the finishing bites he tiptoed, edged around the stump this way, then that. When it began to crack and settle he started toward the canal. He caught a small piece of aspen in his teeth, dragged this down into the canal and left it, and swam on down to the house.

In the water-filled basin at the end of the canal apparently the fresh cuttings were collected and later transferred by water to their place of deposit in the pond. These aspen chunks were from five to eight feet long, were parts of small aspen tree trunks freshly cut off at each end.

Down in the pond, floating above the deposited pile, were numbers of aspen limbs and tops. The bark of these as well as of the larger cuttings was to serve as winter food for the beavers.

Beavers do not eat meat or fish, but chiefly bark, with a little of roots, mushrooms, lily bulbs, and berries. Yet several times during the past year I read of beaver catching fish—out of season, too.

This old beaver frequently appeared, first at one place and then at another. Each time, too, in daylight. He did not seem afraid. But the other beavers were not seen except about sundown, or in the twilight. This old beaver

may have been the leading colonist, the ruler of the colony, if there be such a position.

Beavers coöperate and carry out a distinct plan; in doing this they work both unitedly and singly. The whole work, however, advances as though to a plan and as though under constant supervision. Through the years I have seen beavers working hundreds of times. Their work is nearly always efficient and apparently under the direction of an expert in beaver work; but never have I seen any sign or signal given by a beaver that I could positively say was an order or command. But I see no way of explaining the magnitude of beaver works and the skill shown therein except through coöperation under an acknowledged leader.

One evening as I was watching, a bobcat chased two beavers into the pond. A few yards farther and they would have been overtaken. But the instant they dived into the pond they were safe.

The wild enemies of beavers are lions, bears, wolves, and wildcats; in fact, any flesh-eating animal large enough to kill one. Rarely is a beaver captured in water; he is a swift swimmer and can long remain under water. But on land he is slow getting into action, is not agile, and in going has only low gear. For safety he aims to cut trees that are closest to the water.

Another evening four, and a part of the time five, beavers were pushing and dragging a log. When they at last pushed it into the canal one beaver with only one forepaw put, this forepaw against the end of the log and conducted it down the canal. For safety for travel, and for transportation beavers need deep water.

There is a social side, too, to life in these deep-water homes. Not only do beavers indulge in all kinds of water sports among themselves, but they seem to make friends with some of their diving, swimming neighbours in other animal families.

I had often heard that beavers ever war upon their little brother, the muskrat. The beavers in this colony did not. They continued to use the old repaired house until near the close of their harvesting. On their departure, apparently muskrats at once took possession. But the beavers often went back into the old house.

One day I saw a beaver enter the house. There were a number of muskrats inside. I do not know the nature of his visit but there was no excitement. Another time a beaver turned aside and touched noses with a muskrat. Still another time a beaver playfully dived beneath a muskrat. As the beaver came up the muskrat grabbed beaver fur with forepaws and sat down on the beaver's back. Away swam the

beaver with back above the water, little brother holding on.

The harvest of aspens for winter food was nearly finished, and I had thus far seen only the old beaver doing any tree cutting. The evening of the 19th of October I had gone through the aspen groves measuring and counting. One hundred and twelve aspens had been cut; these were from two to eleven inches in diameter at the place of cutting, and from five to nineteen inches above the ground. The aspens were from twelve to twenty-one feet high.

Just at sundown, as I sat down on a boulder near the aspens, I saw a beaver swimming in the canal toward me. In the basin at the end he smelled of two logs, then came waddling heavily up the much-used trail over which logs were dragged from the aspen grove. His big tail swung slowly from side to side, in places dragging on the ground. He was an old beaver that I had not before seen. He must have weighed fifty pounds. He glanced right and left at aspens and stopped several feet from one, rose up, looked into its top, turned, and looked into the top of another. He went to the second one. Later I saw that the first one was entangled at the top in the limbs of a near-by pine.

Squatting on hind legs with tail bracing be-

hind, he reared up and put forepaws against a four-inch aspen. He took several bites into the tree; then several inches higher—as high as he could reach—he did more biting; after this he split and bit out the space between these two cuttings. He then repeated cutting above and below and again followed by splitting out the chip between—roughly following the plan of an axeman.

Once he stopped to scratch; he rubbed his back against the stump, and clawed at the itchy spot with left forepaw. He ate a mouthful of bark and resumed work. All the cutting had been done from one side, and for the few final bites he scraped a quantity of trash against the stump and stood upon this so as to reach the last bit to be cut off. He was two or three minutes less than an hour in cutting off this four-inch aspen, but aspen is of soft wood. He galloped behind a pine until the aspen tumbled over. Waddling back to it, he snipped off several little limbs, a single bite for each. He scratched his neck. Then he fell rapidly to gnawing the trunk in two. But before this was accomplished he took fright, perhaps from my scent, and went full gallop like a fat cow to the end of the canal and dived in with tail whack and splash.

During summer beavers eat their meals on

the side of the house, or bank of the pond, or on a log or boulder that is above the surface of the pond. If enemy appear the beaver in a second dives to safety. For the winter meal the beaver goes through the inclined tunnel from the house into the water. At the food pile he cuts off a short section of one of the aspens, takes this up into the house, and sits on the floor, which is above water level, to eat the bark.

Two hundred and eight aspens were cut in the grove, dragged to the canal, floated down this and finally deposited in the pond. This made a large food supply for the winter. A little more than one half these were used, and the number of colonists fed probably was nine.

Each spring beavers come out of winter quarters as early as possible and at once begin to use fresh food. If any of the winter food harvest remains canned in the water this is thrown out next autumn and used in dam and house repairs.

Many old beaver colonies have a den in addition to the house, and others have a tunnel under the pond that comes out on shore some distance beyond the shoreline. This tunnel is sometimes used in winter while the pond is frozen over. But these new settlers were without tunnel or den.

These beaver pioneers had founded a new home before winter came. The house was

completed, a deep water pond had stored in it the autumn harvest—food for months. This necessary work was completed a month before the pond froze solid and several weeks before the first snow.

This main pond is off the stream, connecting with it by a ditch through the side of another pond, and will thus receive but little sediment. But each year a layer of fine material will sift in and settle on the bottom, making the pond shallower. Although this pond will live longer than most ponds it, too, will meet the common fate—be filled in with rich soil, be buried and forgotten beneath grass, wild flowers, willows, and groves of trees.

Several times through the ice I saw the beavers in the pond. A number of times I watched them by the food pile cutting off sticks of rations. Other times they were swimming about as though just having their daily cold bath.

While the glassy ice covering of the pond was still clear I once saw them at play in the water beneath the ice; all nine. They wrestled in pairs, they mixed in masses, they raced two and three, they followed the leader circling and criss-crossing. Now and then one dropped out, rose against the under surface of the ice where there was an air pocket, and here I suppose had a few breaths and then resumed the play.

CHAPTER XI

THE WARY WOLF

ONE day in western Wyoming an elk was killed by hunters. It was left lying on the ground all night. Its only protection was a handkerchief tied to one of the horns. Tracks in the snow showed that wolves were about and that they had circled the carcass, but without going close enough to touch it.

In another instance a deer was left out all night in the wolf country.

"How did you protect it?" someone asked the hunter.

"By simply rubbing my hands over it," he answered.

A mature wolf will not eat or touch anything that has human scent upon it, or that carries the scent of iron or steel, which he evidently associates with the deadly scent of man.

A cowboy shot his injured pony and left it lying on the plains. The pony was shod. Wolves did not touch the carcass. On another occasion and in the same locality a pony was

killed by lightning. It was not shod and carried no human scent. Upon this pony the wolves were feasting within a few hours.

The wolf in his struggles with man has become an extremely cautious animal. He is hunted and pursued with deadly ingenuity and persistence. Guns, traps, poison, and dogs are used for his destruction. There is no quarter for him—always a price on his head; and the sum is large. Survivors must be exceptionally wide-awake and wary. The numbers that still survive show that this exacting price of existence has been met. They have not been beaten. Altogether, the wolves now alive probably are much more destructive than their ancestors were, and far more capable of saving themselves from extermination by man.

Much of the time wolves hunt in coöperating packs. They run an animal down by following it in relays; sometimes one or more wolves lie in wait at a point of vantage while others drive or force the victim into the ambush. On an island in Alaska a number of wolves in relays chased a deer and at last drove it into the sea. Near the point where it leaped into the water a swimming wolf was in waiting.

Three wolves chased a young antelope through my mountain camp. Though they nearly ran over me, I doubt whether either the antelope or

the wolves saw me. On they went across the plateau. I hoped that the antelope might escape; but just before he reached the top of a ridge I saw a wolf peering over. The antelope and the wolves disappeared on the other side, where I suppose the drifting clouds and steadfast pines again witnessed a common tragedy of the wild.

On another occasion I saw three wolves drive a deer from a cañon and so direct its course that it emerged where the way was covered with a deep snowdrift. As the deer floundered through the soft snow it was pounced upon by a fourth wolf, which was lying in wait at this point.

Wolves occasionally capture the young, the stupid, and the injured among deer, sheep, elk, and moose; but the big-game loss from wolf depredations probably is not heavy. These wolf-chased animals have developed a wariness and endurance that usually enable them, except perhaps during heavy snows, to triumph over this enemy.

Economically, the food habits of wolves are not entirely bad. In many localities they prey freely upon those ever-damaging pests—mice, rats, rabbits, and prairie dogs. They are also scavengers.

The vast herds of buffaloes used to be constantly followed by countless packs of wolves.

At that time the gray wolf was commonly known as the buffalo wolf, and he is still often spoken of by that name. The wolves were watchful to pounce upon any stray, weak, or injured animal.

Well-authenticated accounts tell us that often a number of buffaloes would convoy a calf or a wounded buffalo to a place of safety. What a strange thing it must have been, out on the plains, to see a pack of wolves, fierce and fiendish, endeavouring to break through the buffalo line of defense that surrounded a retreating calf! Except while migrating, buffalo bulls appeared to have the habit of standing guard over a sick or injured buffalo until the weak one got well or died.

Wolves prey extensively on cattle and sheep; and to a less extent on horses, pigs, and chickens. Many stockmen think that a single pair of wolves may damage cattle herds to the value of a thousand dollars a year. A single wolf has been charged with killing eighty head of cattle in a year, or even ten head of stock in a month. Occasionally a pair of wolves may kill a number of animals in a day. In Texas the red wolf feeds on cattle, colts, sheep, and goats—the gray mostly on cattle; while the black shows a fondness for pork of a better grade than razorback.

The cattle-raising country has a wolf popu-

lation. Formerly wolves followed the buffalo herds in their long drifts and migrations up and down the plains; they now follow the cattle herds in the West. They winter with the cattle in the lowlands, and in the summer accompany the "beef on hoof" up into the high ranges among the peaks.

When they come upon a herd of cattle they isolate one; then one or more wolves systematically attack the head while another or others attack behind. Their powerful jaws snap quickly and cut or crush deeply. They endeavour to hamstring the victim.

On one occasion, in southern Colorado, I saw a herd of cattle standing in a circle with their heads outward. A number of wolves were attacking them. By leaping unitedly—first at one then at another—they finally frightened one victim out of the circle of safety. He was at once driven away from the herd, and in a short time the wolves had disabled his hind legs and pulled him down.

On another occasion, in North Park, Colorado, I saw two wolves pull down three two-year-olds in a short time. I watched them through a field glass. One wolf attacked in front while the other kept leaping and snapping at the flanks and legs until the animal fell. These three animals were killed in less than half an

hour. As they were not eaten, the killing was apparently for the amusement of the wolves.

In wolf-infested cattle territory it is common for one or more cows to guard the calves while the other cows go to water. At a ranch where I made my headquarters for a few days, the plan was being tried of equipping every thoroughbred calf with a bell. This practice proved only temporarily effective in keeping wolves away.

In the cattle country you will find the wolfer —a picturesque character engaged in the peculiar occupation of trying to exterminate wolves. His equipment consists of a rifle, traps, and poison. A few wolfers follow their occupation the year round. Many of them are free trappers—some of them old-timers who have seen better trapping days.

When a wolfer meets another wolfer, or when he is discussing business with stockmen and others who are interested, his talk is likely to run to "Three Toes," a wolf that killed so many cattle on the S. S. Bar Ranch; or to "Old Two Toes," which John Jones succeeded in trapping. He is eager to hear how Smith trapped the last wolf. Just as the prospector has faith that he will find the mythical lost mine, many wolfers firmly believe that they will yet compound a scent which will please the nostrils of the most wary wolf and lure him to his doom.

The hunter and the trapper keep bringing forward new and skillful ways of poisoning and trapping wolves. But getting a wolf becomes increasingly difficult. The majority of wolves now trapped are the young or the stupid ones. Many trappers use traps by the gross. These are set in clusters in selected places—in narrow trails, round carcasses, and in the approaches to stream crossings. The traps are concealed; placed in water; they are deodorized, hidden, and false-scented with offal. Whole batteries are placed before or round a stake the top of which is highly scented with something alluring to wolf nostrils.

One day I watched a trapper spend several hours in placing more than a hundred traps round the carcass of a cow. He avoided touching the carcass. This concealed trap arrangement was as complicated as a barbed-wire entanglement. At one place he set the traps three abreast and five deep. On another probable line of approach he set ten traps, singly, but on a zigzag line. Two fallen logs made a V-shaped chute, which ended close to the carcass. In the narrow end of this chute another cluster of traps was set. Thus the carcass was completely surrounded by numerous concealed traps. It seemed impossible for any animal to walk to the carcass without thrusting a foot into

one of the steel jaws of this network of concealed traps. Yet a wolf got through that night and feasted on the carcass!

Clever ways have been devised to keep human scent off the poisoned meat. Poison is inserted into pieces of meat without touching them with the hand. Then these choice dainties are taken on horseback in a rawhide bucket and scattered with wooden pinchers, the dispenser wearing rubber gloves. Yet most wolves will starve before touching these morsels, evidently scenting the poison!

Forced by poison and traps to avoid most dead stuff that man has touched, the wolf is compelled to do more killing. Then, too, his special development and increased experience, together with his exceptional equipment and opportunity, afford him a living and leave him spare energy and time; so for the fun of it he kills and kills, like a game-hog.

In Montana I once saw a pair of wolves attack a broncho. The horse, which was exceptionally keen-witted and agile, fought the wolves off successfully for several minutes, and finally smashed a hind leg of one with a kick. He then became aggressive, and endeavoured to stamp the injured wolf to death. Under the brave protection of the other wolf, which fiercely fought the enemy, the disabled one

tried to escape; but the horse landed a kick on this fighter, crippled it, and finally killed both.

The new environment of wolf life that accompanied the approach of man demanded a change of habit. Many things that wolves had always done—which had been good enough for their ancestors—must be done no more; things that never had been done must be done at once. It was the old, inexorable law—the survival of the fittest; the passing of those which could not change and cope with newly imposed conditions.

Any one who has had experience with wolves is pretty certain to conclude that they are intelligent—that they reason. A trapper who thinks that a wolf is guided by instinct, who fails to realize lupine vigilance, and forgets that wolves are always learning—ever adapting themselves to changing environment—will be laughed at by a multiplying wolf population.

With astounding quickness the new dangers man introduced into the wolf world were comprehended and avoided. In the decade following 1885 wolves appear to have gained knowledge of human ways more rapidly than man developed in his knowledge of wolf ways. This rapid mental development on their part cannot be called instinct. Plainly it was a case

of intelligence and the wisdom of experience. Surviving wolves have learned absolutely to avoid those insidious means of death that high bounties have led man to invent for their extermination.

Apparently, too, old wolves promptly educate their children; so that the youngsters avoid these new complex dangers. Whether this education is consciously given on the part of the old wolves matters not. The fact that wolves multiplied in the midst of the concerted and relentless war waged against them by man indicates that the youngsters learned how to take care of themselves from the experience and not from the instincts of their parents. The safety-first slogan in the wolf world appears to be: "Avoid being seen by a man; and never, never touch anything that carries the scent of man or of iron or steel."

A generation or two ago a wolf took no pains to keep out of sight; now he uses his wits to avoid being seen. Then it was easy to trap him; now he has become exceedingly difficult to trap. Long-range rifles, poison, and steel traps brought about these changes. It was about 1880 when wolves began to develop this cunning for self-preservation. Heavy bounties brought numerous trappers and hunters into the wolf domain; but such was their develop-

ment that, despite this incessant warring, for fifteen years the wolves actually multiplied.

Both old wolves play with the puppies, and on rare occasions both at the same time. More often one of the old ones allows the puppies to play with it. The old one will lie full length while the puppies tug and chew at its ears, bite and tug at tail, and snap at nose. Upon the old one they climb, trampling and scuffling about. To all this the old one submits without a move, unless it is to encourage or prolong the interest of the puppies.

A mated wolf is happy in the company of the mate. When well fed and with leisure time —no puppies to watch over—they lie in the sun near the den usually with one resting its head upon the body of the other. Or, puppylike, they may wrestle and play together for an hour without ceasing.

Numbers often play together. In the "Adventures of a Nature Guide" I have told of a number playing with a tumbleweed on a windy prairie.

Sometimes they go away exploring. A trip of this kind often carries them far beyond the bounds of their home territory. Sometimes they appear to have a place in mind when they start; again they wander here and there, following each inclination or new interest.

Exploring often brings them in touch with strange wolves. With these there may be battles but more likely organized play, like the relay running of a deer or some other victim. When a number are together they are likely to make life miserable for a mountain lion in case they come upon the trail of one. They will even annoy a bear.

The wolf has extraordinary endurance, great strength, senses amazingly developed, and exceptionally powerful jaws. He is a good swimmer. I have seen wolves swimming vigorously in rivers, wide lakes, and among breakers. They appear to be equally at home in the mountains, in the forest, in thickets, or on the prairie. They probably live from eight to fifteen years.

The coyote, or prairie wolf, is a distinct species, much smaller and with more fox traits than his big brother, the gray wolf.

The wolf is closely related to the dog family; in fact, a Husky, or Eskimo dog, is a domesticated wolf. The track of a wolf is almost identical with that of a dog.

The average weight of a mature gray wolf is close to one hundred pounds. In exceptional cases they have been known to weigh one hundred and fifty pounds. They are, therefore, about twice the weight of the coyote, or prairie wolf, and considerably larger and heavier than

the average collie. For the most part, those near the Arctic regions are larger than those in the southern United States.

Seen in profile at a distance, the back line is comparatively straight. The ears rise just a trifle above this line; in front of the hips the back sags a trifle, while the tail is extended almost straight, with the point held slightly above the level of the back. With the coyote the ears are more prominent, the back more swayed, and the tail droops at a very sharp angle, with the point turned a little upward.

Among Indians wolf pets are common. At an Alaskan Indian encampment I was once greeted by a number of romping Indian children who had several black-faced wolf puppies with faces painted vermilion and yellow.

The puppies are born early in March. The number varies from six to twelve. For the first few weeks they are almost black, especially about the head. For a period after the young cease nursing the mother stays with them much of the time, while the father hunts and brings food to the entrance of the den or into it. At the age of a year the young wolf is still puppylike, and apparently he does not reach maturity until more than two years of age.

Young wolves are sometimes seized by eagles

or foxes; and all wolves are subject to attacks from parasites and disease.

Old storybooks are full of tales of wolf ferocity. Wolves pursue the lone horseman, or even attack the occupants of a sleigh. A fiddler returning at night is forced to take refuge on top of a deserted building or in a treetop; or a mail carrier narrowly escapes with his life after losing his sack. All too frequently we still hear stories of wolves attacking a solitary traveller, but careful investigation of these stories shows them to be sheer fabrications.

The howl of the wolf is deep, while that of the coyote is shrill and high-pitched. It appears that wolves have a language and a system of signalling. These consist of howls, snarls, and barks of varying length, with varying spaces or accents. Wolves prowl and howl mostly at night; but it is not uncommon for them to hunt or to wander in the daytime.

The gray wolf is known also as the timber wolf. He may be gray, grayish yellow, or grayish black, occasionally reddish; and now and then he verges on cream colour. The colour varies greatly, even among the members of a single and perhaps related pack.

Formerly the gray wolf was distributed practically over all North America. Though classified into various sub-species, it really was the

same wolf in Florida and Alaska, in Labrador and Arizona. In different localities he varied in size, colour, and minor characteristics; he necessarily adapted himself to the food supply of his locality and followed the necessary means of getting his food. But everywhere he was really the same gray wolf.

The present wolf population of the United States is not numerous; but it is active, aggressive, and destructive. The animal probably has been exterminated in most of the Eastern States and in California. The coyote probably is economically more beneficial to man than the gray wolf, and does less damage to man's cattle.

In common with most animals, wolves live on a fixed or home range. They spend their life in one locality. This has a diameter of fifteen or twenty miles. To a certain extent its area and form are dependent on the food supply and the topography. One wolf that I knew of had a home range that measured forty by ten miles.

Much of the time wolves run in pairs; and, from both my own observation and that of others, I believe they commonly mate for life. Their home is a den. This most frequently is upon a southern slope. It may be of their own digging or a badger or a prairie-dog hole which

the wolves have enlarged; or it may be a natural cave. In the woods it may be in a huge hollow tree. Almost invariably a pair has a den to themselves. I have heard of a few instances where two litters of wolf puppies were found in the same den; but probably the second litter, in an emergency, had been moved into the den for safety.

Wolves within the bounds of the United States are not ferocious; they do not attack human beings. That they were once ferocious is probable; but years ago they learned the folly of exposing themselves to human beings.

Notwithstanding all this, the wolf is not a coward. He is brave enough when anything is to be gained by being brave. The spectacular, reckless, grand-stand bravery that is pretty certain to be accompanied by death does not appeal to the wolf. Instances are on record, however, where numbers of wolves have risked their lives in order to save or to try to save a wounded companion, either from men or from animals.

A man captured and brought home a number of wolf puppies and placed them in a box inside a high picket fence. He thought the mother might come to their rescue and prepared to entrap her. He took off a picket of

the fence, and placed steel traps inside and outside the fence and in the gap. On the first night the mother did bravely come to the rescue; but she avoided all dangers and carried off her puppies.

CHAPTER XII

WINTER WAYS OF ANIMALS

ON THE way home one winter afternoon I came upon a beaver colony a little below timberline. In the edge of the woods I stood for a time looking out on the white smooth pond. Lines of tracks crossed it from every point of the compass. Two camp birds alighted on a tree within a few feet and looked me over. I heard a flock of chickadees going through the woods.

A lynx came out of the willow clumps on the opposite shore. He walked out on the snowy pond and headed straight for the house. He was in no hurry and stepped slowly along and climbed on top of the house. Here he sniffed a time or two, then raked the house with right forepaw. He sniffed again. Nothing in reach for him.

Climbing down off the beaver house the lynx walked around it and started for the woods near me. Catching my scent he stopped, took a look, then went full speed into the Engelmann spruce forest. Other lynx had visited

the top of the beaver house and also prowled along the bottom of the dam. A number of mountain sheep had crossed the pond a day or two before.

The pond was in a deep gulch and a goodly stream of water out of sight beneath the ice and snow was running into it. The concentrated outflow burst out over the top of the south end of the dam through an eighteen-inch opening. This pond was frozen over for five months. For these five months the beaver each day had a swim or two in the water under the ice. When hungry he took a section of an aspen from the pile on the bottom of the pond. This was dragged under the ice up into the house, where it afforded a meal of canned green bark.

Most summer birds fly away from winter. Other birds and a few animals travel a short distance—go to a place where food is more abundant although the winter there may not be any milder than in the locality in which they summered. Birds that remain to winter in the locality in which they summered, and most of the animals, too, go about their affairs as usual. They do not store food for the winter or even for the following day. The getting of food in the land of snows does not appear to trouble them.

But a number of animals—squirrels, chipmunks, conies, and beavers—store food for the winter. Generally these supplies are placed where they are at all times readily reached by the owners; on the earth, in it, in the water; the place depending on the taste and the habits of the fellow.

Upon the mountain tops the cony, or Little Chief Hare, stacks hay each autumn. This tiny stack is placed in the shelter of a big boulder or by a big rock, close to the entrance of his den. While the beaver is eating green canned bark the cony is contentedly chewing dry, cured hay.

The beaver is one of the animals which solves the winter food and cold problem by storing a harvest of green aspen, birch, and willow. This is made during the autumn and is stored on the bottom of the pond below the ice-line. Being canned in cold water the bark remains fresh for months.

Squirrels store nuts and cones for winter food. Most squirrels have a regular storing place. This covers only a few square yards or less and usually is within fifty or sixty feet of the base of the tree in which the squirrel has a hole and a winter home.

Commonly, when dining, the squirrel goes to his granary or storage place and uses this for

a dining room. A squirrel in a grove near my cabin sat on the same limb during each meal. He would take a cone, climb up to this limb, about six feet above the snow, back up against the tree and begin eating. One day an owl flew into the woods. The squirrel dropped his cone and scampered up into the treetop without a chirp.

Another day a coyote came walking through the grove without a sound. He had not seen me and I did not see him until the squirrel suddenly exploded with a sputtering rush of squirrel words. He denounced the coyote, called him a number of names. The coyote did not like it, but what could he do? He took one look at the squirrel and walked on. The squirrel, hanging to the cone in his right hand, waved it about and cussed the coyote as far as he could see him.

A number of species of chipmunks store quantities of food, mostly weed seed. But no one appears to know much of the winter life of chipmunks.

Chipmunks around my home remain under ground more than half of the year. Two near my cabin were out of their holes only four months one year. They were busy these four months gathering seeds and peanuts which they stored underground in their tunnels. Twice by

digging I found the chipmunks in a sleep so heavy that I could not awaken them, and I believe they spend much of the eight months underground sleeping. Digging also revealed that they had eaten but little of their stored supplies.

When food becomes scarce and the weather cold and snowy, a number of animals hole up—go into a den. By hibernating, sleeping away the weeks the earth is barren and white, they triumph over the ways of winter. Bears and ground-hogs are famous hibernators. Many chipmunks and some species of squirrels hibernate for indefinite periods.

The Bat and the Bear, they never care
  What winter winds may blow;
The Jumping-mouse in his cozy house
  Is safe from ice and snow.

The Chipmunk and the Woodchuck,
  The Skunk, who's slow but sure,
The ringed Raccoon, who hates the moon,
  Have found for cold the cure.

—Samuel Scoville, Jr., in *Everyday Adventures.*

Animals which hibernate, fast and sleep through much or all of the winter, are not harmed and possibly are benefitted by the fasting and sleeping. Bears and ground-hogs are

fat when they go to bed in the autumn and fat and strong when they come out in the spring.

A snowy winter gives a bear den a cold-excluding outer covering—closes the entrance and the airholes. Most bears and ground-hogs appear to remain in the den all winter. I have known an occasional ground-hog to thrust out his head for a few minutes now and then during the winter, and bears may come forth and wander about for a time, especially if not quite comfortable. I have known a number of bears to come out toward spring for brief airings and sunnings.

Mid-winter a bear wanted more bedding. In fact, he did not have any, which was unusual. But the winter was cold, no snow had fallen, and the frigid wind was whistling through his poorly built den house. The usual snow would have closed the airholes and shut out the cold. He was carrying cedar bark and mouthfuls of dried grass into the den.

This same winter I came upon another bear. Cold or something else had driven him from his den. When I saw him he was trying to reopen an old den which was back in a bank under the roots of a spruce. He may have tried to dig a den elsewhere, but the ground was frozen almost as hard as stone. While he was working

a bob-cat came snarling out. The bear struck at it. It backed off sputtering then ran away. In tearing out a root the bear slipped and rolled down the bank. He went off through the woods.

Late one February I came upon a well-worn bear trail between the sunny side of a cliff and an open den. In this trail there were tracks fresh and tracks two or more weeks old. Elsewhere I have seen many evidences that bears toward spring come out briefly to sun themselves and to have an airing. But never a sign of their eating or drinking anything.

Near my cabin I marked four ground-hog holes after the fat fellows went in. On September tenth I stuffed a bundle of grass in the entrance of each den. Sometime during the winter one of them had disturbed the grass and thrust out his head. Whether this was on Ground-hog Day or not, I cannot say. The other ground-hogs remained below until between April seventh and twelfth, about seven months. And these seven months were months of fast, and possibly without water.

The raccoon, who ever seems a bright, original fellow, appears to have a hibernating system of his own. Many a raccoon takes a series of short hibernating sleeps each winter, and between these sleeps he is about hunting food, eating and living as usual. But I believe these

periods of hibernating often correspond to stormy or snowy periods.

While trying to see a flock of wild turkeys in Missouri one winter day I had a surprise. The snow showed that they had come out of the woods and eaten corn from a corn shock. I hoped to see them by using a near-by shock for a blind and walked around the shock. The snow over and around it showed only an outgoing mouse track. No snow had fallen for two days.

I had gotten into the centre of the shock when I stepped on something that felt like a big dog. But a few seconds later, when it lunged against me, trying blindly to get out, it felt as big as a bear. I overturned the shock in escaping. A blinking raccoon looked at me for a few seconds, then took to the woods.

Deep snow rarely troubles wild life who lay up food for winter. And snow sometimes is even helpful to food storers and also to the bears and ground-hogs who hibernate, and even to a number of small folk who neither hibernate nor lay up supplies.

One winter afternoon I followed down the brook which flows past my cabin. The last wind had blown from an unusual quarter, the northeast. It made hay-stack drifts in a number of small aspen groves. One of these drifts

was perhaps twenty feet across and about as high. The treetops were sticking out of it.

On the top of the snowdrift a cotton-tail was feeding happily off the bark of the small limbs. This raised platform had given him a good opportunity to get at a convenient food supply. He was making the most of this. At the bottom he had bored a hole in the snow pile and apparently planned to live there.

While peeping into this hole two mice scampered along it. This snow would protect them against coyotes. Safe under the snow they could make their little tunnels, eat grass and gnaw bark, without the fear of a coyote jumping upon them.

Tracks and records in the snow showed that for two days a coyote did not capture a thing to eat. During this time he had travelled miles. He had closely covered a territory about three miles in diameter. There was game in it, but his luck was against him. He was close to a rabbit, grabbed a mouthful of feathers—but the grouse escaped, and even looked at a number of deer. At last, after more than two days, and possibly longer, he caught a mouse or two.

Antelope in the plains appear to live in the same territory the year round. Many times in winter I have been out on the plains and found a flock feeding where I had seen it in

summer. But one snowy time they were gone. I found them about fifteen miles to the west, where either less snow had fallen or the wind had partly swept it away. The antelope were in good condition. While I watched them a number started a race.

The wolves had also moved. A number of these big gray fellows were near the antelope. Just what the other antelope and the other wolves who used this locality did about these new folks, I cannot guess.

Mountain deer and elk who usually range high during the summer go to the lowlands or several miles down the mountains for the winter. They may thus be said to migrate vertically. One thousand feet of descent equals, approximately, the climatic changes of a thousand-mile southward journey. They may thus winter from five to twenty-five miles from where they summered, from one thousand to several thousand feet lower. The elk that winter in the Jackson Hole region have a summer range on the mountains forty or fifty miles away. But elk and deer that have a home territory in the lowlands are likely to be found summer after summer in the same small, unfenced pasture.

Moose, caribou, deer, and elk during heavy snows often resort to yarding. Moose and

caribou are experts in taking care of themselves during long winters of deep snows. They select a yard which offers the maximum food supply and other winter opportunities.

One snowy winter I visited a number of elk that were yarding. High peaks rose snowy and treeless above the home in the forest. The ragged-edged yard was about half a mile long and a quarter of a mile wide. About one half the yard was a swamp covered with birch and willow and a scattering of fir. The remainder was a combination of open spaces, aspen groves, and a thick growth of spruce.

Constant trampling compressed the snow and enabled the elk readily to move about. Outside the yard they would have bogged in deep snow. In the swamp the elk reached the moss, weeds, and other growths. But toward spring the grass and weeds had either been eaten or were buried beneath icy snow. The elk then ate aspen twigs and the tops and limbs and bark of birch and willow.

Ease of movement in this area enabled the elk to keep enemies at bay. Several times I saw from tracks that lion had entered this self-made wild life reservation, and on two occasions a number of wolves invaded it. But each time the elk had bunched in a pocket of a trampled space and effectively fought off the wolves.

One day late in February I visited the yard. The elk plainly had lost weight but were not in bad condition. While I lingered near the entire herd joined merrily in chase and tag, often racing then wheeling to rear high and fence with heads. If I counted correctly this herd went through the entire winter without the loss of an elk.

But the caribou appears to be the only animal which migrates between summer and winter ranges, that is, which makes a long journey of hundreds of miles; as much change of place as made by many species of migrating birds. The main cause for this migration is the food supply, but myriads of mosquitoes in the woods may be one cause of the moose moving each summer far into the north where there are grassy prairies and large openings in the woods. But for winter they seek food and shelter in a yard in the forest.

While snowshoeing in the forested mountains to the southeast of Long's Peak I came upon a mountain lion track startlingly fresh. I followed it to a den beneath a rock pile at the bottom of a cliff. Evidently the lion was in. Seeing older tracks which he had made on leaving the den, I trailed these. After zigzagging through the woods he had set off in a bee-line for the top of a cliff. From this point he evi-

dently saw a number of deer. He had crawled forward, then back-tracked and turned to the right, then made round to the left. The snow was somewhat packed and his big feet held him on the surface. The deer broke through.

The lion climbed upon a fallen tree and crept forward. He was screened by its large upturned root. At last he rushed out and seized a near-by deer and killed it, evidently after a short struggle. He had then pursued and killed a young deer that had fled off to the left where it was struggling in the heavy snows. Without returning to the first kill the lion fed off the second and returned to the den.

I followed the other deer. In a swamp they had fed for a time on the tops of tall weeds among the snow and willows. I came close to them in a thick growth of spruce. Here the snow was less deep. A goodly portion of the snow still clung to the trees.

These deer circled out of the spruce swamp and came into their trail made in entering it. Back along this trail they followed to where the lion had made the first kill. Leaping over this dead deer they climbed up on the rocky ridge off which so much snow had blown that they could travel speedily most of the time over the rocks with only now and then a stretch of deep snow.

Often during my winter trips I came upon

a porcupine. Both winter and summer he seemed blindly content. There were ten thousand trees around, and winter or summer there were meals to last a life-time. Always he had a dull, sleepy look and I doubt if he ever gets enthusiastic enough to play.

Birds that remain all winter in snowy lands enjoy themselves. Like the winter animals, usually they are well fed. But most species of birds with their airplane wings fly up and down the earth, go northward in the spring and southward in the autumn, and thus linger where summer lingers and move with it when it moves.

Around me the skunks hibernated about two months each year; some winters possibly not at all. Generally the entire skunk family, from two to eight, hole up together. One den which I looked into in mid-winter had a stack of eight sleepy skunks in it. A bank had caved off exposing them. I left them to sleep on, for had I wakened them they might not have liked it. And who wants to mix up with a skunk?

Another time a snowslide tore a big stump out by the roots and disclosed four skunks beneath. When I arrived, about half an hour after the tear-up, the skunks were blinking and squirming as though apparently too drowsy to decide whether to get up or to have another good sleep.

Many tales have been told about the terrible hunger and ferocity of wolves during the winter. This may sometimes be so. Wolves seem ever to have good, though not enormous, appetites. Sometimes, too, they go hungry for days without a full meal. But generally, if the winter is snowy, this snow makes it easier for them to make a big kill.

Deer, elk, and mountain sheep occasionally are caught in deep snow, or are struck by a snowslide. A number sometimes are snowbound or killed at one time. Usually the prowling wolves or coyotes discover the kill and remain near as long as the feast holds out.

Once I knew of a number of wolves and two lions lingering for more than two weeks at the wreckage brought down by a snowslide. I was camping down below in the woods and each evening heard a hullabaloo, and when awake in the night I heard it. Occasionally I heard it in the daytime. Finally a grizzly made a discovery of this feeding ground. He may have scented it or he may have heard the uproars a mile or two away. For the wolves and the lions feasted, fought, and played by the hour. The row became so uproarious one night that I started up to see what it was all about. But the night was dark and I turned back to wait until morning. Things had then calmed down,

and only the grizzly remained. After he ran off I found that from fifteen to twenty deer had been swept down by the slide and mixed with the tree wreckage.

The right kind of winter clothing is an important factor for winter life for both people and animals. The clothing problem perhaps is more important than the food question.

Winter in the Temperate Zone causes most birds and animals to change clothing—to put on a different suit. This usually is of winter weight and in many cases of a different colour than that of the summer suit. Bears, beavers, wolves, and sheep put on a new, bright, heavy suit in autumn and by spring this is worn and faded. The weasel wears yellow-brown clothes during summer, but during winter is in pure-white fur—the tip of the tail only being jet black. The snowshoe rabbit has a new suit at the beginning of each winter. This is furry, warm, and pure white. His summer clothes are a trifle darker in colour than those of other rabbits. If there is no snow he eats with his feet on the earth or on a fallen log or rock pile, but if there is a deep snow he has snowshoes fastened on and is ever ready to go lightly over the softest surface.

In these ways—hibernating, eating stored food, or living as in summer time from hand to mouth—the animals of the Temperate Zone

go contentedly through the winter with a change of habit and all with a change of clothing. The winter commonly is without hardship and there is time for pranks and play. Winter, so the animal Eskimos say, and so the life of the Temperate Zone shows, will bear acquaintance.

CHAPTER XIII

PRONGHORN OF THE PLAINS

I AWAKENED one morning out on the Great Plains to find that in the dark I had camped near the nursery of a mother antelope and her two kids. It was breakfast time. Commonly both antelope children nurse at once, but this morning it was one at a time. Kneeling down, the suckling youngster went after the warm meal with a morale that never even considered Fletcherizing. Occasionally he gave a vigorous butt to hasten milk delivery.

Breakfast over, the mother had these youngsters lie low in the short grass of a little basin. She left them and began feeding away to the south. The largest objects within a quarter of a mile were a few stunted bunches of sagebrush. I moved my sleeping bag a short distance into an old buffalo wallow and watched her. She fed steadily up a moderate slope but was always in position where she could see the youngsters and the approach of anything in the unobstructed opening round them. This mother was not eating the abundant buffalo grass celebrated

for its nutrition, nor any of the blooming plants. She was eating, and plainly with relish, simply the gray-green bitter leaves of the shrubby scattered sage. On reaching the low summit of the prairie swell she paused for a little while on the skyline, then started on a run for a water-hole about two miles distant.

A few seconds later a fox-like head peeped over a little ridge a few hundred feet from the kids. Then a distant bunch of sagebrush transformed itself into another moving form, and two coyotes trotted into the scene. Evidently these coyotes knew that somewhere near two youngsters were hidden. They followed the mother's trail by scent and kept their eyes open, looking for the youngsters.

Old antelope have perhaps more numerous scent glands than other big wild animals, but evidently a young antelope gives off little or no scent. Its youthful colour blends so well with its surroundings when it lies down that it is difficult to see it. Once the young flatten out and freeze upon the grassy earth they offer but little that is revealing even to the keenest eyes and noses.

Both coyotes paused within a few feet of one of the kids without either seeing or scenting it. It was flattened out between two clumps of sagebrush. Finally, unable to find the youngsters, the coyotes trotted off along the mother's trail.

I went over to have a look at the children. Though I knew just about where they were I looked and circled for some time before my eyes detected them. They were grayish brown with the outlines of future colour scheme faintly showing. Within two feet of each I stood and watched them. A fly crawled over the eye and ear of one kid and an ant over the nose of the other, and yet neither made a move.

For about two weeks, while the legs of the young are developing liveliness, the mother keeps aloof from her kind. She often has a trying time with enemies.

As soon as the coyotes were out of sight I hastened to the highest near-by point hoping with glasses to see the mother antelope. She was just leaving the water-hole. Her movements evidently were a part of a strategic plan to deceive the watchful eyes and the cunning noses of enemies, chiefly coyotes. She fed a quarter of a mile south, then ran on for more than a mile still farther. She then galloped more than two miles northeast and later, with many doublings which involved her trail, worked back to the youngsters.

In following and watching the movements of the mother I stumbled over a lone antelope kid about half a mile from the other two. I returned later and found that it was entangled

between the twisted low-lying limbs of a sagebrush. Not until I laid hold of the kid to drag it out did it make a move. Then it struggled and gave a low bleat.

Realizing that this might bring the mother like lightning I let go and rose up. There she was, coming like the wind, and only four or five hundred feet away, indifferent to the fact that man is the most dangerous of enemies. Just how close she might have come, just what might have happened had I not straightened up at that moment, is sheer guesswork. But the freed youngster butted me violently behind and then ran off to meet his mother.

During most of the year the great silent plains are at rest in tawny and gray brown. The dreamy, sunny distances show only moving cloud shadows. A brief barrage of dust storm sometimes sweeps across or a wild drive of tumbleweeds with a front from horizon to horizon goes bounding and rolling toward the rim, where they go over and vanish. But these endless distances are palpitating with flowers and song when the young antelope are born.

One May morning a flock of blackbirds alighted upon a leafy cottonwood tree—a lone tuft in an empire of treeless distances. They sang all at once—a whirlwind of song. Two antelope herds were on separate skylines.

The silvery, melodious peal of the yellow-breasted meadow lark rang out all over the wide wild prairie. Prairie dogs scampered, barked, and played; butterflies circled and floated above the scattered and stunted sage; thousands of small birds were busy with nest and song, and countless ragged spaces of brilliant wild flowers illuminated the grass-green surface to every horizon.

The antelope is known as the pronghorn, because of a single small prong on each horn. This prong is more like a guard and serves as a hilt. In fighting an antelope often catches its opponent's thrust on this prong. The horn commonly is less than ten inches long. Many females do not have horns, and rarely are these fully developed on any female.

Deer and elk have deciduous horns—that is, horns that are shed annually. Goat and bighorn never shed their horns. But each year antelope sheds the outer part—the point and sheath—of the horn, retaining the stubs or stumps which grow new horns.

The antelope has a number of marked characteristics and some of these are unique. It is without dew claws; the hair is hollow and filled with pitch; teeth are of peculiar pattern; it eats mostly bitter or pungent food; has large, long-range eyes of almost telescopic power;

has numerous and scattered scent glands; is without colour camouflage—in fact, its colour is in part revealing, for the bristling of its white buttocks serves to give signal flashes. The antelope is the plains' graceful racing model of long and successful development. It is either the least—the smallest—or near the smallest of our hoofed wild animals.

The antelope is specialized in speed. If there were to be a free-for-all race on the plains, with deer, antelope, elk, sheep, bear, lion, coyote, fox, dog, horse, and even the rabbit as starters, the antelope generally would be the winner, whether the race was for one mile or ten. Perhaps the blooded race horse and the greyhound would outstrip him, but among wild animals the antelope is the speedy one.

Wolves and coyotes pursue the pronghorn in relays or capture it strategically through various kinds of mutual aid. Now and then an antelope will turn upon its pursuers and fight them fiercely, occasionally triumphantly.

On the Great Plains in western Nebraska I saw two speeding objects stirring dust on the horizon. It was an antelope cut off from the flock and pursued by a wolf. They plunged for a moment or two in a dip of the plains, then reappeared. With glasses on them I saw the pursuing wolf drop out and another wolf leap

from concealment to relieve him. Following them through glasses as they raced on skyline against a cloud, dropped below eyeline, dashed behind a butte, swiftly the great circle followed brought them within half a mile. In plain view another wolf leaped into the race. The antelope was nearly exhausted. The wolves were leaping at her throat as she disappeared over a ridge. Little puffs of dust showed the advance of pursuer and pursued. These grew dim and I watched for the runners to come up on the skyline. But they never appeared.

I watched a coyote walk back and forth close to a mother antelope with two young kids. She paid no apparent attention to him. But she was besieged. After two or three hours he was relieved by another coyote. This was a new and rather leisurely way of relaying. Evidently the devilish plan was to wear the antelope out or stay until she was forced to go for water and then seize the youngsters.

It was more than fifteen miles to the next water-hole. This may have been the second or even the third day that the coyotes had been worrying her. I frightened them away, but had not gone half a mile when I saw them circling back again. I do not know the end of the story, but as I walked on I wished that this mother antelope might have possessed the special

development of the pronghorn in the desert regions—the ability to do without water for days at a time.

The food of the pronghorn is sage, greasewood, sometimes cactus, and, on the desert, broomrape. I do not recall ever seeing him eat grass. In the extremely arid regions of the Southwest the local flocks, in common with mountain sheep and other animals of the desert, have developed the habit of doing without water for days—sometimes for a period of two weeks or longer have no other moisture than that furnished by the plants eaten.

When the young antelope are about three weeks old they appear to have full use of their legs and usually follow the mother in feedings and fights. At this time numbers of mothers and youngsters collect and run together. They are thus enabled to give mutual aid and to withstand coyotes and other enemies better. Sometimes under dangerous conditions the young are left behind while some of the mothers go for water, and on their return the remaining ones go. Just why this mutual aid is not practised while the young are almost helpless is not clear.

In early autumn all ages and sexes unite and commonly run together, often in large flocks, throughout the winter. The youngsters often

play together. Frequently one of the males is the lively leader of twenty or thirty. At other times the old antelopes play, go through a series of marches and countermarches. They race back and forth and over short circles. When thus engaged they commonly have sentinels posted on the outskirts.

Most other animals appear to forget possible enemies while playing, but the nervous antelope, with big open spaces round it, appears never to be quite in repose.

Depending upon speed rather than upon stealth, fighting ability, or concealment, as a means of escaping enemies, and living in the plains with a magnificence of unobstructed distances, it has learned to be watchful, to use sentinels, and to flee even when danger is afar.

Usually when the antelope lies down it selects a spot well away from any ravine, bluff, willow clump, or sagebrush thicket that could conceal an enemy or that would enable an enemy to approach it closely unseen.

Under most conditions the female appears to be the acknowledged leader. In the majority of instances in which I have watched moving flocks of antelope—fleeing small numbers or a number of alarmed antelope preparing to move—it was under female leadership.

The pronghorn lives in a home territory.

This I think is rarely more than six or eight miles in diameter. If pursued by man, dogs, or wolves it is likely to run in great circles, keeping within the bounds of home territory. Most antelope are not migratory, but in a few localities the flocks make a short migration. For winter they may travel to a more broken locality, one that gives some shelter from the wind and contains spaces off which the wind sweeps the snow.

The antelope makes long leaps but not high jumps. I watched an antelope that had been separated from the flock hurrying to rejoin it. In its way was a line of willows along the dry, shallow water channel. This willow stretch was not wide nor high. A deer would have leaped it without the slightest hesitation. The antelope went far round and jumped wide gullies, but made no attempt to leap this one low line of willows. Being a plains animal, knowing but little of cliffs and timber, it has not learned high jumping.

For ages the antelope was thickly scattered over the Great Plains and the small parks of the West, Northwest, and Southwest. Fifty years ago they were numbered by millions. The present antelope population numbers not more than 15,000. Howard Eaton tells me that years ago he sometimes saw several thousand in a single

day. Once when a boy I saw at least a thousand in a North Park, Colorado, flock.

A few are now protected in the national parks and in private antelope reserves. But they are verging well toward extermination. Rarely does the antelope thrive in captivity. Apparently the food ordinarily fed it in captivity does not agree with it.

Mature antelope are marked with what may be called revealing colours, which advertise their presence and make them easily visible at long distances: rich tan to grayish brown on the back and sides, with clean white buttocks and sides of face and belly; the throat faintly striped with white and brown; and a touch of near-black on the head. The antelope's colour is so distinctive and stands out so well against most backgrounds that it may be classed as an animal with revealing coloration.

Two white rump patches flare up during excitement; the crowded and bristling hairs may be seen at surprisingly long distances.

Possibly these hairs are also under conscious control. At any rate, let one or a number on a ridge see an approaching enemy and these white patches stand out, and the next adjacent flock, even though two or three miles away, will see the sign—or signal—and also take alarm. Though the antelope does not do any wireless

wigwagging, the sudden flare of white buttocks is revealing.

Depending chiefly on speed in escaping his enemies, the antelope has also the added advantage of being able to detect an enemy while he is still afar. The plains where he lives enable him to see objects miles away, and his eyes being of telescopic nature ofttimes enable him to determine whether a distant moving object is friend or foe.

It thus is important that an antelope be so marked that another antelope will recognize him at long range. Each flock of antelope watches the distant surrounding flocks, and each flock thus mutually aids the others by acting as an outlying sentinel for it. If a flock sees an object approaching that may be an enemy it strikes attitudes which proclaim alarm, and, definitely marked, their actions at once give eye messages of alarm to all flocks in view and close enough to make out what they are doing. It would thus seem that the revealing colours of the antelope have been of help in protecting —that is, perpetuating, the species.

The antelope is nervous and is easily thrown into a panic. Though it is often canny and courageous, it lacks the coolness, the alertness, and the resourcefulness—that is to say, the quick wit and adaptability—of the mountain

sheep. In the Yellowstone and the Wind Cave National Parks are numbers of antelope. Many of these have readjusted themselves to the friendly conditions and have lost most of their nervousness and fear of man.

They have a bump of curiosity. I paused one afternoon to talk to a homesteader on the prairie. He was fencing, and presently commenced stretching a line of barbed wire. The penetrating squeaks of the wire reached the ears of several unseen antelope and appealed to their curiosity. They came close, about the distance from third to home plate.

Well might they have shown concern at barbed wire! It has wrought terrific destruction to the species.

A generation or so ago it appears to have been easy for the hunter by displaying a red flag or some partly concealed moving object to rouse antelope curiosity and to lure numbers. I have repeatedly seen this trick tried and a few times I have patiently endeavoured with this appeal to bring a flock within range of my double-barrelled field glass, but I didn't succeed. They promptly went over the horizon. They are curious still, but have become wiser.

I suppose it will never do to reach final conclusions concerning what an animal will do under new conditions. After a few years of intimate

acquaintance with the plains antelope I visited the Yellowstone region, thinking that I was well grounded in all antelope habits. One day I came upon a flock in a deep grassy forest bay in the edge of a dense woods. Thinking to get close I walked in behind them. To my amazement they darted into the woods, dodging trees right and left like lightning, and hurdling fallen trees as readily as any deer or mountain sheep that I have seen. They well illustrated a phase of animal behaviour called ecology, or response to environment.

The pronghorn or antelope is distinctly American. Fossilized antelope bones have been found in western Nebraska that are estimated to be two million years old. This antelope family is not related to the African or Asiatic antelope, nor to any American mammal species; it is alone in the world.

Many prehistoric species of animals that lived in the same scenes with the ancient ancestors of the antelope have been extinct for thousands of years. The rhinoceros, toothed birds, American horses, ponderous reptiles, and numerous other species failed to do what the antelope did—readjust to each radical change and survive. Climatic changes, new food, strange enemies, uplifts, subsidences, wild volcanic outpourings, the great Ice Age—over all these the antelope has triumphed.

CHAPTER XIV

THE MOUNTAIN LION

RAISING my eyes for an instant from the antics of a woodchuck, they caught a movement of the tall grass caused by a crawling animal. This presently showed itself to be a mountain lion. He was slipping up on a mare and colt on the opposite edge of the meadow. The easy air that was blowing across my face—from horse to lion—had not carried a warning of my presence to either of them.

I was in Big Elk Park, seated on a rock pile, and was nearly concealed by drooping tree limbs. Behind me rose the forested Twin Peaks, and before me a ragged-edged mountain meadow lay in the forest; and across this meadow the lion crawled.

The colt kicked up its heels as it ran merry circles round its mother. This beautiful bay mare, like her colt, was born in unfenced scenes and had never felt the hand of man. She had marked capability and the keenness exacted by wilderness environment.

I watched the bending grass as the lion crept

closer and closer. Occasionally I caught a glimpse of the low-held body and the alert raised head. The back-pointing, sensitive three-foot tail, as restless as an elephant's trunk, kept swinging, twitching, and feeling. Planning before the lion was within leaping distance to warn the mare with a yell, I sat still and watched.

The well-developed and ever-alert senses of the mare—I know not whether it was scent or sight—brought a message of danger. Suddenly she struck an attitude of concentration and defiance, and the frightened colt crowded to her side. How capable and courageous she stood, with arched neck, blazing eyes, vigilant ears, and haughty tail! She pawed impatiently as the lion, now near, watchful and waiting, froze.

Suddenly he leaped forward, evidently hoping to stampede both animals and probably to seize the separated colt. Instantly the mother wheeled, and her outkicking heels narrowly missed the lion's head. Next the lion made a quick side-leap to avoid being stamped beneath the mare's swift front feet.

For half a minute the mare and lion were dodging and fighting with all their skill. A splendid picture the mare made with erect tail and arched neck as she struck and wheeled and kicked!

Again and again the lion tried to leap upon

Photo. by Shep N. Husted

Lake Agnes and Mount Richthofen in the Never Summer Range

the colt; but each time the mother was between them. Then, watching his chance, he boldly leaped at the mare, endeavouring to throw a forepaw round her neck and, at the same instant, to seize and tear the throat with his savage teeth. He nearly succeeded.

With the lion clinging and tearing at her head, the audacious mare reared almost straight on her hind legs and threw herself backward. This either threw the lion off or he let go. She had her nose badly clawed and got a bite in the neck; but she was first to recover, and a kick landed upon the lion's hip. Crippled, he struggled and hurried tumbling away into the woods, while the bleeding mare paused to breathe beside the untouched colt.

The mountain lion is called a puma, catamount, panther, painter, or cougar, and was originally found all over North America. Of course he shows variations due to local climate and food.

The lion is stealthy, exceedingly cunning, and curious in the extreme; but I am not ready, as many are, to call him cowardly. He does not have that spectacular rash bravery which dashes into the face of almost certain death; but he is courageous enough when necessity requires him to procure food or to defend himself and his kind. He simply adapts himself

to conditions; and these exact extreme caution.

The mountain lion may be called sagacious rather than audacious. Settlers in his territory are aware of his presence through his hogging the wild game and his occasional or frequent killing of colts, horses, cattle, sheep, and chickens. But so seldom is he seen, or even heard, that, were it not for his tracks and the deadly evidence of his presence, his existence could not be believed.

Though I have camped in his territory for weeks at a time, and ofttimes made special efforts to see him, the number of lions I have seen —except, of course, those treed by dogs—is small.

When a mountain lion is frightened, or when pursued by dogs, he is pretty certain to take refuge in a tree. This may be a small tree or a large one. He may be out on a large limb or up in the top of the tree.

The lion is a fair runner and a good swimmer. Often he has been known to swim across lakes, or even arms of the sea, more than a mile wide. And he is an excellent tree climber, and often uses a living tree or a dead leaning one as a thoroughfare—as a part of his trail system on a steep mountain side. Twice I have seen him on a near-by limb at night watching me or my fire. Once I woke in the night and saw a lion upon

two out-reaching tree limbs not more than eight feet above me. His hind feet were upon one limb, his forefeet upon a lower limb, and he was looking down, watching me curiously. He remained in this position for several minutes, then turned quietly, descended the tree on the opposite side, and walked away into the woods.

It is probable that lions mate for life. Sometimes they live year after year in the same den and prowl over the same local territory. This territory, I think, is rarely more than a few miles across; though where food is scarce or a good den not desirably located, they may cover a larger territory.

Lions commonly live in a den of their own making. This is sometimes dug in loose sand or soil where its entrance is concealed among bushes. Sometimes it is beneath a fallen log or a tree root, and in other places a semi-den, beneath rocks, is enlarged. In this den the young are born, and the old ones may use it a part of each year, and for year after year.

Though occasionally a mother lion may raise as many as five kittens, rarely does she succeed in raising more than two; and I think only two are commonly brought forth at a birth. These kittens probably remain with the mother for nearly a year, and in exceptional cases even longer. As I have seen either kittens or their

tracks at every season of the year, I assume the young may be born at any time.

The mountain lion is a big-whiskered cat and has many of the traits possessed by the average cat. He weighs about one hundred and fifty pounds and is from seven to eight feet long, including a three-foot tail. He is thin and flat-sided and tawny in colour. He varies from brownish red to grayish brown. He has sharp, strong claws.

Mr. Roosevelt once offered one thousand dollars for a mountain lion skin that would measure ten feet from tip to tip. The money was never claimed. Apparently, however, in the state of Washington a hunter did succeed in capturing an old lion that weighed nearly two hundred pounds and measured ten and a half feet from tip to tip. But most lions approximate only one hundred pounds and measure possibly eight feet from tip to tip.

The lion eats almost anything. I have seen him catching mice and grasshoppers. On one occasion I was lying behind a clump of willows upon a beaver dam. Across the pond was an open grassy space. Out into this presently walked a mountain lion. For at least half an hour he amused or satisfied himself by chasing, capturing, and eating grasshoppers. He then laid down for a few minutes in the sunshine;

but presently he scented something alarming and vanished into the thick pine woods.

One evening I sat watching a number of deer feeding on a terrace of a steep mountain side. Suddenly a lion leaped out, landing on the neck of one. Evidently the deer was off balance and on a steep slope. The impact of the lion knocked him over, but like a flash he was upon his feet again. Top-heavy with the lion, he slid several yards down a steep place and fell over a precipice. The lion was carried with him. I found both dead on the rocks below.

The lion is a master of woodcraft. He understands the varying sounds and silences of the forest. He either hides and lies in wait or slips unsuspected upon his victim. He slips upon game even more stealthily than man; and in choosing the spot to wait for a victim he usually chooses wisely and, alert waits, if necessary, for a prolonged time. He leaps upon the shoulders and neck of horse, deer, or sheep, and then grabs the victim's throat in his teeth. Generally the victim quickly succumbs. If a lion or lioness misses in leaping, it commonly turns away to seek another victim. Rarely does it pursue or put up a fight.

A friend wished a small blue mule on me. It had been the man's vacation pack animal. The mule loitered round, feeding on the abun-

dant grass near my cabin. The first snow came. Twenty-four hours later the mule was passing a boulder near my cabin when a lion leaped upon him and throttled him. Tracks and scattered hair showed that the struggle had been intense though brief.

Not a track led to the boulder upon which the lion had lain in wait, and, as the snow had fallen twenty-four or more hours before the tragedy, he must have been there at least twenty-four hours, and he may have waited twice as long.

Another time I frightened a lion from a cliff where he was waiting for a near-by flock of bighorn sheep to come within leaping distance. Though it was nearly forty-eight hours since snow had ceased falling, not a track led to the lion's watching place or blind.

The lion probably is the game hog of the wilds. Often I have read his red records in the snow. On one occasion he killed nine mountain sheep in one attack. He ate a few pounds of one of them and never returned to the kill. On another occasion he killed eleven domestic sheep in one night. Inside of twenty-four hours a lion killed a doe, a fawn, a porcupine, a grouse, and was making a try for a mountain sheep when I appeared on snowshoes. He seems to prefer colts or horses for food.

Mr. J. A. McGuire, editor of *Outdoor Life*, who has made special investigations concerning the killings of mountain lions, estimates that a lion will kill a deer every week if he has the opportunity to do so. From personal experience I have known him to kill four deer in a single week.

On one occasion, when I was hidden and watching the carcass of a deer which a lion had killed to see what carnivorous animal might come to the feast, a mountain lion walked quietly and unalertly to it and commenced to eat. After a few minutes the lion suddenly bristled up and spat in the direction from which a grizzly bear presently appeared. With terrible snarling and threatening, the lion held on to the prize until the grizzly was within a few feet. He then leaped toward the grizzly with a snarl, struck at it, and dashed into the woods. The grizzly, without even looking round to see where the lion had gone, began eating.

From many experiences I believe that much of the killing of domestic and wild animals attributed to bears is done by lions. The lion prefers warm blood and fresh meat for each meal, and will kill daily if there is opportunity. I have known bears to follow mountain lions evidently for the purpose of obtaining food. One day I came upon the recently killed car-

cass of a cow. Only mountain lion tracks led to it and from it. The following night I spent at a near-by ranch house, and the rancher informed me that on the previous day he had discovered a bear eating the carcass of this cow which he accused the bear of killing. The lion is a most capable raider of ranches, and colts, horses, sheep, pigs, and poultry are his prizes.

In northern New Mexico one day I saw a lion bounding across an opening carrying a tame sheep in its mouth. On another occasion I saw a lion carrying off a deer that apparently weighed much more than the lion itself. The lion appeared to have the deer by the shoulder, and it was resting on the lion's shoulders in such a way that I do not believe it touched the ground.

I suppose when the lion makes a kill in an out-of-the-way place, where he may eat with comparative safety, he does not take the trouble to carry or to drag the victim off. Often, of course, the kill is made for the benefit of the young, and hence must be transported to the den.

It is quite true that he will sometimes wander back to his kill day after day and feast upon it. It is also true, when food is scarce, that lions will eat almost anything, even though they have nothing to do with the killing. They have been trapped at the bait that was out for bears: and so, though a lion prefers blood and warm meat,

he will return to his kill to feast, or, if food is scarce, gladly eat whatever he can obtain.

From many observations I judge that after eating he prefers to lie down for a few hours in some sunny or secluded spot, or on a many-branched limb generally well up toward the top of the tree but sometimes not more than ten feet above the earth.

The lion has extreme curiosity. He will follow travellers for hours if there is opportunity to keep out of sight while doing so. Often during long snowshoe trips I have returned over the route first travelled. Lion tracks in the snow showed that I was repeatedly followed for miles. In a number of places, where I had taken a long rest, the lion had crept up close, so that he could easily watch me; and on a few occasions he must have been within a few feet of me.

While walking through a forest in the Medicine Bow Mountains I was startled and knocked down by a glancing blow of a tree limb. This limb had evidently broken off under the weight of a lion. The lion also came tumbling down but caught a claw on a limb and saved himself from striking the earth. Evidently in his curiosity to see me he had leaned out too far on a weak limb. He fled in confusion, perhaps even more frightened than myself.

The mountain lion is not ferocious. Mr.

Roosevelt, in summing up its characteristics, concluded that it would be no more dangerous to sleep in woods populated with mountain lions than if they were so many ordinary cats.

In addition to years of camping in the wilds in all sorts of places and under all conditions of weather I have talked with careful frontiersmen, skillful hunters and trappers, and these people uniformly agreed with what I have found to be true—that the instances of mountain lions attacking human beings are exceedingly rare. In each of these cases the peculiar action of the lion and the comparative ineffectiveness of his attacks indicated that he was below normal mentally or nearly exhausted physically.

Two other points of agreement are: Rarely does any one under ordinary conditions see a lion; and just as rarely does one hear its call. Of the dozen or more times I have heard the screech of the lion, on three occasions there was a definite cause for the cry—on one a mother frantically sought her young, which had been carried off by a trapper; and twice the cry was a wail, in each instance given by the lion calling for its mate, recently slain by a hunter.

During the past thirty years I have investigated dozens of stories told of lions leaping upon travellers from cliffs or tree limbs, or of other stealthy attacks. When run down each

of these proved to be an invention; in most cases not a lion or even lion track had been seen.

Two instances of lion attacks are worth mentioning. One night in California a lion leaped from a cliff, struck a man, knocked him down, and then ran away. Out of this incident have come numerous stories of lion ferocity. The lion was tracked, however, and the following day the pursuing hunter saw it crossing an opening. It suddenly clawed and hit at a boulder. Then, going on, it apparently ran into a tree, and fought that. As it started on the hunter shot it. This beast was badly emaciated, had a swollen face from an ulcerated tooth, and was nearly, if not entirely, blind.

Another instance apparently was of a weak-minded lion. As though to attack, it came toward a little ten-year-old girl in Idaho. She struck it over the head with a bridle she was carrying. Her brother hurried to the rescue with a willow fishing pole. Together they beat the lion off and escaped with a few bad scratches. Yet had this been a lion of average strength and braveness he must have killed or severely injured both.

The mountain lion rivals the shark, the devil-fish, and the grizzly in being the cause of ferocious tales. The fact that he takes refuge on limbs as a place of lookout to watch for people

or other objects, and that he frequently follows people for hours through the woods without their ever seeing him—and, I suppose, too, the very fact that he is so rarely seen—make him a sort of storm centre, as it were, for blood-curdling stories.

Through years I investigated plausible accounts of the ferocity of mountain lions. These investigations brought little information, but they did disclose the fact that there are a few types of lion tales which are told over and over again, with slight local variations. These tales commonly are without the slightest basis of fact. They are usually revamped by a clever writer, a frightened hunter, or an interesting story teller, as occasions offer. One of the commonest of the oft-told tales that have come to me through the years is as follows:

"Late Saturday evening, while Mr. and Mrs. Simpson were returning from the village through the woods, they were attacked by a half-starved mountain lion. The lion leaped out upon them from brush by the roadside and attempted to seize Mr. Simpson. Though an old man, he put up a fight, and at last beat off the lion with the butt of the buggy whip."

Sometimes this is a family and the time of day is early morning. Sometimes the lion is ferocious instead of half-starved. Sometimes it is of enormous size. Once in a while he leaps

from a cliff or an overhanging tree limb. Generally he chews and claws someone up pretty badly, and occasionally attempts to carry off one of the children.

Many times my letter addressed to one of the party attacked is returned unclaimed. Sometimes my letter to the postmaster or the sheriff of the locality is returned with the information: "No such party known." Now and then I ask the sheriff, the postmaster, or the storekeeper some questions concerning this attack, and commonly their replies are: "It never happened"; "It's a pipe dream"; "A pure fake"; or "Evidently whoever told you that story had one or two drinks too many."

One day I came out of the woods in the rear of a saw-mill. I was making my way to the living room of the place, between logs and lumber piles. Right round the corner of a slab heap I caught sight of a mountain lion just as it leaped at me. It missed me intentionally, and at once wheeled and rose up to play with me. In the two or three seconds that elapsed between the time I had my first glimpse of it and when I realized it was a pet I had almost concluded that, after all, a lion may be a ferocious animal.

On one occasion, when I was on a cliff at the edge of a grassy opening, I was astonished to

see a coyote trot leisurely across and just before he disappeared in the woods a lion appear on the opposite side of the opening, following contentedly along the trail of the coyote. The next day I again saw this friendly pair, but on this occasion the lion was leading and the coyote following. Afterward I saw their tracks a number of times.

Just why they were associated in this friendly manner we can only conjecture. It will be readily seen that the coyote, which has all the wisdom of a fox, might follow a game-hog lion about and thus, with little effort, get a substantial and satisfactory food supply. But why the lion should willingly associate with a coyote is not quite clear. Perhaps this association proved to be of some advantage to the lion in his killing, or it may have been just one of those peculiar, unaccounted-for attachments occasionally seen between animals.

In any discussion concerning the mountain lion, or, for that matter, any living animal, hardly can the last word be said concerning the character of the individual of the species. Individuals vary, and now and then a mountain lion, as well as a human being, shows marked and peculiar traits. These may be the result of unusual alertness and sheer curiosity, or they may be subnormal, and cruel or murderous.

CHAPTER XV

FAMINE IN BEAVER-LAND

COLD weather came one fall before my new beaver neighbours had laid in their winter's food. They had harvested one food supply several miles down stream but a fierce forest fire had devastated the region while they were in the midst of their preparations for winter and left their home site unliveable. The beavers in a body started off to found a new colony, having the hardships and adventures that ever fall to pioneers.

The place selected for their new home was on a tributary stream not far from my cabin. Here they built a typical house of sticks, sod, and mud. The stream ran through an old glacier meadow partly overgrown with forest. One side carried a belt of pines. Beyond the pines was a ragged and extensive growth of quaking aspen. Up stream the mountain rose steeply to the summit of Mt. Meeker.

While the beavers were working on a dam which was to give them ample water in the pond to prevent its freezing to the bottom, a trapper

came into the region. He lingered and broke and rebroke the dam three or four times. When he finally left, autumn was half gone and preparations for winter in the new colony were only well begun. The dam was still low and uncompleted. As yet they had not begun cutting and storing aspen for their winter's food supply.

These beavers had been industrious. They had planned well. But it was a case of one misfortune quickly following another. A severe cold wave still further and seriously handicapped the harvest gathering of the colonists. The quieter reaches of the stream were frozen over and a heavy plating of ice was left on the pond. They would have difficulty transporting their food-cut aspens under such conditions.

Winter supplies for this colony—green aspen or birch trees—must be had. Ordinarily, beavers cut the trees most easily obtained: first those on the shore of the pond, then those up stream, and finally those on near-by, down-hill slopes. Rarely does a beaver go fifty feet from the water. But if necessary he will go down stream and float trees against the current, or drag trees up steep slopes. This pond did not have, as is common, a border of aspen trees.

Late October I visited this new wilderness home. In the lower end of the frozen pond was a two-foot hole in the ice. This had been

gnawed by the beavers, but for what purpose I could not then imagine.

One crew of loggers had started to work in a grove about two hundred feet from the hole in the ice. They were cutting aspens that were about four inches in diameter and twelve feet high. But before dragging them to the pond an opening or trailway through the woods had been cleared. Every bush in the way was cut off, every obstructing log cut in two and the ends rolled aside.

Dragging their tree cuttings to the pond was slow, hard work, and it was also dangerous work for a slow-moving beaver to go so far from the water. A beaver is heavy bodied and short-legged. With webbed hind feet he is a speedy swimmer, but on land he is a lubber and moves slowly and with effort.

A few days later the purpose of the hole in the ice of the frozen pond was made plain. A freshly swept trail in the snow led to it out of the woods. The beavers were taking their green aspen cuttings through the hole into the pond for their winter's food. They had begun storing winter food at last.

I followed the trail back to where a number of aspens had been cut. Their stumps were about fifteen inches above the snow. Two trees still lay where they fell. These were about six

inches in diameter and perhaps twenty feet long. Preparatory to being dragged to the pond they had been gnawed into sections of from three to six feet.

The beavers had not nearly finished their harvesting when a heavy fall of snow came and they were compelled to abandon their carefully made dragway and the aspen grove where they had been cutting. The nearest aspens now available were only sixty feet from the edge of the pond. But a thick belt of pines and a confusion of large, fallen, fire-killed spruce logs lay between the pond and this aspen grove.

Deep snow, thick pines, and fallen logs did not stop their harvest-gathering efforts. Tracks in the snow showed that they went to work beyond the belt of pines. During one night five beavers had wallowed out to the aspens, felled several and dragged them into the pond. But wolves appeared to realize the distress of the beavers. They lurked about for opportunities to seize these hunger-driven animals. While harvesting the aspen grove wolves had pounced upon one of the beavers at work and another on his way to the pond had been pursued, overtaken, and killed in the deep snow.

During three days of good weather which followed, ever watchful for wolves, the beavers cut few aspens. Then came another snowstorm.

The work of harvesting winter supplies was still further hindered.

But beavers never give up. To obtain aspens which were to supply them with winter food they finally dug a tunnel. They began this on the bottom of the pond near the shore and dug outward toward the aspen grove. The tunnel was about two feet under the surface for fifteen feet. From this point it inclined upward and came out under a pine tree, close to the aspens. In only the last few feet, where the digging was through frozen ground, was there difficult digging of this tunnel. Apparently the thick carpet of fallen leaves and the deep snow checked the frost and the earth had not frozen deeply.

From the end of this tunnel the beavers cleared a dragway about eighteen inches wide to the aspen grove. In doing this they cut through three or four large logs and tunnelled under a number of others. Then aspens were felled, cut in short sections, dragged to the end of the tunnel, pushed through this out into the pond beneath the ice, and finally piled on the bottom of the pond close to the house.

Solid snowdrifts formed in the grove while this slow work of transportation was going on. A few aspens were cut from the top of a five-foot snowdrift. The following summer these

stumps suggested that prehistoric beavers—large as bears—had reappeared on earth.

At last cold, ice, snow, and enemies completely stopped the beavers' harvest gathering. The food provided for the colony's winter supply was less than one half that needed. But the beavers had done their best, and come what may, they would alertly, stoically meet it.

These colonists had a hard winter. I visited them a number of times. Now and then snow covered the frozen pond, but usually the wind in sweeping down the open-stream avenue through the woods left the ice clear. One day, looking through the clear ice of the pond, I counted six beavers, but on most occasions I was able to see only one or two. The population of this colony probably numbered twelve or fifteen.

The upper part of the area flooded by their pond had been a semi-swampy tract bearing thick growths of water-loving plants. The roots of sedge, bulbs of lilies, tubers of many plants, and long juicy roots of willow and alder were made use of by these beavers facing a food-shortage.

I supposed it was only a question of time before they would be shut off by the thick ice from this root supply. But they dug a deep waterway—a canal about two feet wide and nearly as deep—from the house in the centre of the

pond to the heart of the rooty area. Even after most of the pond was frozen to the bottom they had an open line of communication with the root supplies.

Mutual aid is a factor in beaver life. I do not know how many days' work this ditch required; but when one of the beavers in a colony work, all work. Since late summer these beavers had worked at one task after another; they had unitedly worked for the welfare of each member of the colony. With mutual aid beaver colonists achieve much in a short time. Their strong love for home, causing them to remain long in one place, and the peculiar work which this calls for, makes changes on earth sometimes enduring for centuries.

But they had only commenced to dig out the roots on the bottom of the pond when the ever-thickening ice froze over this life-saving food supply. The water would have been deeper over this area but the beavers' early hard luck had prevented their building the dam as high as it should have been.

I do not know how they handled the food-shortage, whether or not they went on short rations. But no beaver had more than his portion, for beavers are coöperators, they work in common, and so long as the food supply lasts each has his share.

I had glimpses of the beavers' eager digging through the clear spots in the ice. They tore the root-filled section to pieces and devoured all that it contained. But not until the following summer, when the broken dam released the water, did I realize how deeply and completely the bottom of the pond had been stirred and ploughed. I have seen gardens uprooted by hogs, and mountain meadows dug to pieces by grizzly bears, but neither of them equalled this.

The supply of roots ran out and the bark of the green aspens was eaten off, and still this mountain region was white with winter and the pond locked and sealed with ice. Beavers are strict vegetarians. There were trout in the pond, but these were not caught; nor were the bodies of the starved ones eaten, as sometimes occurs among other animals. The beavers must escape from their now foodless prison or perish.

Spring examinations which I made indicated that they had tried to escape through the long tunnel which had been made to obtain the aspens, but this had nearly filled with ice. They had then driven several feet of a new tunnel, but evidently found they could not accomplish it through the frozen, gravelly earth. Beavers are engineers—the handling of earth in building dams or in the making of canals is as much in their line as tree felling—but cutting and tun-

nelling through gravelly, frozen earth is near impossible for them.

They then attempted to cut a hole upward through the two feet of ice, as I found out later when the ice was breaking up. And they had almost succeeded. On the edge of their house they had raised a working foundation of mud and sticks and gnawed upward to within three or four inches of the surface. Beavers are expert gnawers and have been known with their powerful teeth and strong jaws to gnaw off and fell trees more than two feet in diameter. Perhaps they might have succeeded eventually, but they apparently found another and better way out of the pond.

What they finally did was to tunnel out through the unfrozen earth beneath the bottom of the dam. They had commenced on the bottom of the pond and driven a fifteen-inch tunnel nearly level through the base of the dam, and a foot or two beneath the water and below frostline. This came out in the ice-covered stream channel, beneath the frozen earth. As this tunnel had to be dug under water, it must have been slow work and to have constantly called for relay efforts. When a working beaver had to breathe it was necessary for him to swim to the house and climb up to the floor, above water level, in order to obtain air.

Tracks of six muddy-footed fellows on the snow at the outer end of the successful tunnel told the number who survived the winter's food-shortage. Spring came, and warmth and flood water broke up the ice on the pond about a month after they escaped. No young beavers were seen. These surviving beavers lived in bank holes along the stream until summer. Then they wandered away. Late that August they, or six other beavers, came to the place. They completed the dam and repaired the house, and by mid-October had a huge pile of food stored in the pond for the winter.

CHAPTER XVI

DOG-TOWN DIGGINGS

ABOUT thirty years ago a cowboy took me out to see "The big Dog-town." This metropolis was in the heart of the great plains near the Kansas-Colorado line. For five hours we rode westward along the southern limits of the town. It extended on over the horizon more than two miles wide and about forty miles long. A town with a population of two million!

Its visible inhabitants would have astounded a census-taker or a dog-catcher. Thousands of prairie dogs were yipping and barking more than sixty times a minute, and stub tails were whizzing away at the same time. We rode out among the crowded and protesting dogs and stopped to watch them. A number ducked into their holes.

Around each hole was an earthy collar less than two feet across and four or five inches high. At a distance this earthy collar surrounding the hole had the appearance of a low mound. Evidently this mound is to keep out storm water.

There were thousands of these holes, each with its dog. One near-by dog sat up on his mound like a ten-pound sea lion. He watched us with concentrated attention. His tongue and tail were still. When my hat started toward him he simply dropped into the hole. There were scattered holes which had a rabbit or two little owls at its doorway. Throughout the town were little orchards of dwarfed sagebrush and a scattering of tall weeds. A showy bed of prickly pear cactus inside the town limits was not inhabited.

The prairie dog is a sun worshipper. He keeps aloof from localities where willows are an enemy-hiding screen and where trees cast a shadow. His populous cities are in arid lands where for three hundred days each year they have their place in the sun.

The dogs seemed to be ever moving about, visiting or barking. A young dog near me ambled over to visit another. These two called on a third and while in session were joined by one's, two's, and companies until there were several dozen massed.

A young dog left his hole-top after a survey and started off for a call. But he turned aside to join and mingle with the crowd for a minute or two, then went on with his call. All this time there were several dogs behind me energeti-

cally protesting at or about something. Cheerfulness and vivacity characterized this fat, numerous people, but they were always alert, and commonly maintained sentinels scattered throughout the town.

While numbers were visiting or playing a few were feeding. They appeared to feed at all times of the day. But I do not believe that they eat half the food of the average woodchuck. The short grass was the principal food. They also ate of the various weeds around. I do not recall seeing them eat the bark of sagebrush or any part of the prickly pear.

Prairie dogs must materially assist in soil formation. Their digging and tunnelling lets dissolving water and disintegrating air into the earth and deepens the prairie soil.

The congesting population in time increases the soil supply. In places and for a time this new soil seems to be helpful in increasing the food supply, but after a time in many towns food becomes scarce. Food scarcity causes movement. I have heard that the entire population of a dog town, like an entire species of migrating birds, will leave the old town and trek across the plains to a site of their liking.

A generation ago the prairie dog population must have exceeded two hundred millions. It was scattered over the great plains and

the rocky region from the Canadian line to Mexico.

Dog towns are dry towns. My cowboy friend had repeated to me what everyone thus far had told him:

Prairie dogs dig down to water.

Prairie dogs, snakes, and owls all use the same den.

The water supply of dog towns and also their congested life so interested me that I visited a number of them to study the manners and customs of these citizens.

For two months not a drop of rain had fallen in Cactus Center. Not a bath nor a drink had the dogs enjoyed. I hurried into the town immediately after a rain thinking the dogs might be on a spree. I had supposed they would be drinking deeply again and swimming in the pools. But there was no interest. I did not even see one have a drink, although all may have had one. A few dogs were repairing the levee-crater rim of their holes, but beyond this things went on as usual. The rain did not cause dog town to celebrate.

On a visit to the "Biggest dog town in the world," near the Staked Plains in Texas, and where there were dogs numbering many millions, I watched well drillers at a number of places. Several of these wells, in the limits of dog town,

struck water at three hundred feet, none less than this depth. This told that dogs did not dig down to water. They are busy diggers and have five claws on each foot but they do not dig through geological ages to obtain water.

One day two cowboys came along with a shovel which was to be used in setting up a circular corral and I excited their interest in prairie dog dens. We made the dirt lively for two hours but we did not reach bottom. I examined old and new gullies by dog towns but learned nothing. Finally, a steam shovel revealed subterranean secrets.

This steam shovel was digging a deep railroad cut through a dog town. The dogs barked and protested, but railroads have the right of way. The holes descended straight and almost vertically into the earth to the depth of from ten to fourteen feet. From the bottom a tunnel extended horizontally for from ten to forty feet. There was a pocket or side passage in the vertical hole less than two feet below the top: and a number of pockets or niches along the tunnel with buried excrement in the farther end of the tunnel. The side niches were used for sleeping places and side tracks. There was a network of connecting tubes between the vertical holes and communicating tunnels between the deeper tunnels.

I found the underground works of the dogs similar in other railroad cuts. None of the holes reached water, in fact, they were extra dry in the bottom.

Prairie dogs in common with many species of plants and animals of the arid districts require and use but little water. Dogs do without water for weeks except such moisture as is obtained from plants eaten. A part of each year the plants are about as dry as dog biscuit.

There were from a few dozen to a thousand dogs upon or in an acre; from a few holes to more than one hundred in an area the size of a baseball diamond.

Although the plains had numerous large and populous places there were leagues without a single dog. Apparently the dogs keep on the higher and the well-drained land.

One day I watched some fat, happy puppies amusing themselves. They played, but without much pep, while mothers remained near to guard and to admire.

Prairie dogs often play. But never, I think, alone like the grizzly. In groups and in hundreds they played the universal game of tag. They were fat and low-geared and their running gallop made an amusing effort to get somewhere. There were several boxing exhibitions, or

farces. Their fat bodies and extremely short legs and slow, awkward movement made their efforts more ludicrous even than those of fat men boxers. There was a kind of snake dance with entangled countermarching in which most dogs tried to be dignified while many acted as though in new company and did not know what was expected of them.

One of their plays consisted in a single dog mimicking a stranger or an enemy. A bunch of dogs acted as spectators while an old dog highly entertained them by impersonating a coyote, at least his exhibition reminded me very much of coyote. The old dog imitated the coyote's progress through dog town, with the usual turning, looking, smelling, and stopping. He looked into holes, rolled over, bayed at the heavens, and even tried the three-legged gallop. During most of his stunts the spectators were silent but toward the last he was applauded with violent cursings and denunciation—at least so it sounded. A number of other folks were imitated, but just who they were my natural history and the actor's presentation gave no clue. Apparently the skunk was imitated. The actor's interpretation was good. The congested audience watched him closely, with now and then a yip, but mostly in silence.

But sometimes there are less peaceful scenes

in dog town. A dog town without a coyote would be like Hades without Mephistopheles.

The prairie dog likes to keep close to his hole, or to the hole of a neighbour into which he can duck and escape the surprise raids of the coyote.

The coyote stalks patiently, hiding until a dog comes close or is too far from his hole to outrun the coyote to it. Coyotes hunt in pairs or fours and often while one, two, or three of them are holding the attention of the dogs the other coyote makes a sudden dash. Sometimes they take sheer delight in stirring up things in congested corners of dog town.

As I stood watching them, screened by the cottonwood, two coyotes crossed the corner of dog town and set it all agog. While these coyotes made their way leisurely through dog town the dogs sat on their crater-like mounds and uttered rapid-fire protests, ready to drop into safety in case of a rush by the coyotes. Suddenly two old dogs wheeled and yapped at highest rattling speed. While the first pair of coyotes was attracting attention a second pair appeared. The old dogs violently denounced the second pair for this surprise. But the coyote is ever doing the unexpected.

On the outskirts of Cactus Center numerous pairs of coyotes had enlarged prairie dog holes for a den. Pairs of prairie owls occupied other

deserted dog holes, rabbits possessed many, and two were taken by skunk families.

The black-footed ferret is the terrible enemy of prairie dogs. This small, agile, powerful fellow boldly invades the dens and slays the dog, rabbit or other inmates. The dogs do not appear even to attempt to resist him. But apparently he does not often call.

The mixed population of dog towns is not at peace. Lizards, rabbits, dogs, owls, snakes congest in the same block, but the block is red in tooth and claw. In a few cases I noticed these warring species all used the same subway entrance, but below the surface they surely lived in separate apartments.

No, the rattlesnake, prairie dog, and owl do not lie down together, unless a flood or other calamity throws them together.

One time I was approaching a town limits where yelpings and yappings filled the sky like a wind. From the summit of the ridge treeless, houseless, fenceless plains extended in leagues of level distances to every horizon. Before me there must have been one hundred thousand dogs swarming like the inhabitants of a disturbed ant hill. Beside a lone and grizzled old cottonwood I explored localities of dog town through my glasses.

Cloud shadows were sliding in silence across

the green plains in which the golden banner bloomed like broken yellow coral. A cottontail hopped slowly from his hole to a clump of Spanish bayonet; buzzing gnats and bees hummed by. Grasshoppers all jumping toward the town limits suggested that they were abandoning the congested town.

Suddenly there were two disturbances: Near me an old dog was set upon by a protesting, noisy mob of dogs, while off on my left an invading rattlesnake threw a locality into a frenzy of excitement.

Apparently dogs aim to bury alive all enemies and invaders. The frightened rattler was pursued by a screeching, noisy dog mob, and driven into a dog hole. While two or three dogs kept watch of this, other dogs were looking into or wildly watching other dog holes which the snake might reach through underground tunnels.

Out of one of these holes he glided and at him went the yapping, snapping dog mob. Down into another hole he ducked. Evidently the dogs realized that this hole was detached, and the dogs fell over each other with efforts to claw earth into it. Presently the hole was filled to the collar and the snake buried. On this filled hole the dogs danced with weird and uncanny glee.

The other dog mob evidently rough handled

the outcast dog but I missed most of this in watching the snake mob. It, too, was a vehement, noisy mob. The wise old dog refused to go into a hole but was literally jammed in, with earth clawed in after him until the hole was filled, then another barbaric, triumphal war dance upon the buried one.

Rattlesnakes eat young dogs and sometimes boldly enter the dens for them during the mother's absence.

But what was the offense of the old dog which had been attacked by his fellows? Was it crime or misdemeanour? Had he been misunderstood, or was it a case of circumstantial evidence? In other dog towns I have seen the populace putting one of their number to death, and in this town, about two years later, I saw two dogs entombed by the same wild mob. In this case even the sentinels forgot the coyote and joined the mob. Were the executed ones murderers, robbers, or had they denied some ancient and unworthy superstition and like reformers paid the penalty of being in advance of popular opinion?

One afternoon Cactus Center had a storm. Black clouds suddenly covered the sky and a storm swept the prairie. A barrage of large hailstones led, striking the prairie violently at an angle so sharp that stones bounded and rolled

for long distances. One which struck me in the side felt like a thrown baseball. There was a thumping, deep roar while they dashed meteorically down.

Dog town watched the hail but was deserted before the first raindrop fell. The downpour lasted for several minutes with a plentiful accompaniment of crashing of lightning.

A deep sheet of water swept down from the prairie beyond the town limits to the west, where the rainfall was a cloudburst. The sheet of water overspread the town and temporarily filled hundreds of the inhabited dens.

Out came the sputtering, protesting dogs. Numbers, perhaps hundreds, were drowned. Across the soaked prairie I hurried, catching the effects and the movements. I pulled several gurgling dogs from their water-filled holes, each of them making nip-and-tuck efforts to climb out.

The following morning a pair of coyotes slipped up the invading gully trench into town. Occasionally these crafty fellows peeked over the bank. Then they crept farther in, and one peeped from a screen of sagebrush on the bank. Suddenly both dashed out and each killed two dogs. The entire village howled and yapped itself hoarse while the invaders feasted within the town limits. Leisurely the coyote at last

moved on through the town turning aside to sniff at the drowned dogs.

One spring I called early in Cactus Center and found blackbirds, robins, and other northbound birds among the visitors. Among these was a flock of golden plover, one of the greatest of bird travellers. These birds were resting and feeding. They probably were on their way from the far South American plains, to their nesting ground on the treeless grassland around the Arctic Circle.

During an early summer visit to this dog town it was decorated with wild flowers—sand lilies, golden banner, creamy vetch, and prickly poppy. I wandered about in the evening twilight looking at the evening star flowers while a coyote chorus sounded strangely over the wide, listening prairie. Near me was a dog hole; its owner climbed up to peep out; in a minute or so he retired without a bark or a yap.

The magnificent visible distances of the plains seem to create a desire in its dwellers to see everything that is going on around. And also a desire for sociability, for herds. Buffalo crowded in enormous herds, the antelope were sometimes in flocks of thousands, and the little yellow-brown dogs crowded and congested.

The old cottonwood tree which stood on one edge of Cactus Center dog-town limits was the

observed of all observers. Through the years it must have seen ten thousand tragedies, comedies, courtships, plays, and games of these happy little people of the plains.

No dog hole was within fifty feet of the old cottonwood tree. The tree probably offered the wily coyote concealment behind which he sometimes approached to raid; and from its top hawks often dived for young dogs, for mice, and also for grasshoppers. I suppose owls often used it for a philosophizing stand, and also for a point of vantage from which to hoot derision on the low-down, numerous populace.

But the old tree was not wholly allied with evil, and was a nesting site for orioles, wrens, and bluebirds. From its summit through the summer days the meadow lark with breast of black and gold would send his silvery notes sweetly ringing across the wide, wide prairie.

CHAPTER XVII

ECHO MOUNTAIN GRIZZLY

A GRIZZLY bear's tracks that I came upon had the right forefoot print missing. The trail of this three-legged bear was followed by the tracks of two cubs—strangely like those of barefooted children—clearly impressed in the snow. These tracks were only a few hours old.

Hoping to learn where this mother grizzly and her cubs came from I back-tracked through the November snows in a dense forest for about twenty miles. This trail came out of a lake-dotted wooded basin lying high up between Berthoud Pass and James Peak on the western slope of the Continental Divide. The three-legged mother grizzly was leaving the basin, evidently bound for a definite, far-off place. Her tracks did not wander; there had been no waste of energy. A crippled bear with two cub children and the ever-possible hunter in mind has enough to make her serious and definite.

But the care-free cubs, judging from their tracks, had raced and romped, true to their

play nature and to youth. The mother's tracks showed that she had stopped once and looked back. Possibly she had commanded the cubs to come along, but it is more than likely that she had turned to watch them. Though ever scouting for their safety and perhaps even now seeking a new home, yet she probably enjoyed their romping and with satisfaction had awaited their coming.

I had gone along reading the story these bears had written in the snow without ever thinking to look back. The following morning I realized that this grizzly may have been following me closely.

I spent that night with a prospector from whom I learned many things of interest concerning this three-legged grizzly. Truly, she was a character. She had lived a career in the Berthoud Pass Basin.

Only a few weeks before, so the prospector told me, a trapper had captured one of her cubs and nearly got the grizzly herself. A grizzly bear is one of the most curious of animals. In old bears this constant curiosity is supplemented and almost always safeguarded by extreme caution. But during cubhood this innate curiosity often proves his misfortune before he has learned to be wary of man.

The trapper, in moving camp, had set a

Photo. by Emerson E. Lynn

Sheep Lake and Mummy Range

number of small traps in the camp rubbish. He felt certain that if a bear with cubs should be prowling near, the cubs on scenting the place would rush up to investigate before they could be restrained by the mother. There would be little to rouse her suspicion, she doubtless having smelled over many abandoned camp sites, and she, too, might be trapped.

One of this grizzly's three cubs was caught. She and the two other cubs were waiting with the trapped one when the trapper came on his rounds, but at his appearance they made off into the woods. The trapper set a large steel trap and left the trapped cub as a decoy.

The mother bear promptly returned to rescue the trapped cub. In her excited efforts she plunged her right forefoot into the large trap. Many grizzlies appear to be right-handed, and her best hand was thus caught. An old grizzly is seldom trapped. But this bear, finding herself caught, did the unusual. She gnawed at the imprisoned foot to get away, and finally, at the reappearance of the trapper, tore herself free, leaving a foot behind her in the trap. She fled on three feet, driving the two cubs before her.

Then, though crippled, she returned that same night to the scene where the cub was trapped. Not finding it she followed the scent to the

miner's cabin, in which the cub was chained. Here she charged one of the dogs so furiously that he literally leaped through the window into the cabin. The other dogs set up a great to-do and the three-legged bear made off into the woods. As soon as her leg healed she apparently left Berthoud Pass Basin on the trail which I had discovered, and set off like a wide-awake, courageous pioneer to find a new home in a more desirable region.

A miner came to the prospector's cabin before I had left the next morning and told the story of her attempted rescue of the cub during the preceding night. She had left her two cubs in a safe place and evidently returned to rescue her third trapped cub. She went to the miner's cabin where the captured cub had been kept. The dogs gave alarm at her presence and the miner going out fired two shots. She escaped untouched and straightway started back to the other cubs.

This so interested me that I decided to trail her from the basin. After following her fresh trail for about three miles this united with the trail she had made in leaving the basin—the trail which I had back-tracked the day before. Travelling about ten miles, beyond where I had first seen the trail the day before, I came to a cave-like place high up on the side of Echo

Mountain. Here she had left the cubs the night before. Tracks showed that she was then in the cave with them. I did not disturb them, but I did revisit their territory again and again.

In this cave they hibernated that winter. It was a roomy, natural cave formed by enormous rock fragments that had tumbled together at the base of a time-worn cliff. The den which the grizzly and cubs used the first winter was not used again, nor were their later hibernating places discovered.

The grizzly's new domain was about thirty miles to the northward of her former wilderness home. It was a wild, secluded region between Echo Mountain and Long's Peak.

Grizzlies often explore afar and become acquainted with the unclaimed territory round them, and it is possible that this mother grizzly knew the character of the new home territory before emigrating. There was an abundance of food in the old home territory, but it is possible that she had lost former cubs there and it is certain that she had been shot at a number of times. However, the change may have been simply due to that wanderlust which sometimes takes possession of the ever-adventurous grizzly. In the eventful years which followed she showed tireless energy and skill. Though badly crippled, she still maintained those qualities which

mean success for the survival of the species—the ability to make a living, the postponing of death, and the production of offspring.

The Echo Mountain grizzly had individuality and an adventurous career. This heroic grizzly mother might be called an emigrant or an exile, or even a refugee. Though crippled, she dared to become a pioneer. All that men learned of her eventful life was a story of struggles and triumphs—the material for the biography of a character.

The next July a camper in following the track of a snowslide came upon a three-legged mother grizzly and two cubs. They were eating the carcass of a deer that was just thawing from the snow and débris brought down by the snowslide. The grizzly was nearly white, one cub was brown, and the other dark gray.

As the camper went on with his burro he noticed the bear watching him from among trees across a little glacier meadow. He camped that night on a small stream at the foot of an enormous moraine a few miles from the place where he had seen the bear. Returning from picketing the burro he chanced to glance at the skyline summit of the moraine. Upon it the three-legged bear stood watching him. She was looking down with curious interest at his tent, his campfire, and the burro. Surely this crip-

pled grizzly was living up to the reputation of the species for curiosity. A moment later she disappeared behind a boulder. With his field glasses he could still see her shadow. This showed her standing behind the boulder with her one forepaw resting against it and peeping from behind it.

That autumn a trapper out for pine martens saw the Echo Mountain grizzly and her cubs. He reported her a great traveller; said that she ranged all over her large and rugged Rocky Mountain territory. Her tracks were seen on the summit of the range and she occasionally visited the other side of the divide. Perhaps she felt that an intimate knowledge of the region was necessary for a crippled bear in meeting emergencies. This knowledge certainly would be valuable to her in making her living and a marked advantage if pursued.

This rugged scenic mountain wilderness now is a part of the Rocky Mountain National Park. It must have been a wonderland for the child-like cubs. In the lower part of this territory are a number of moraines, great hills, and ridges covered with grass and dotted with pines. There are many poetic beaver ponds. The middle slopes are black with a spruce forest and cut with a number of cañons in which clear streams roar. Up at eleven thousand feet the

forest frays out with dwarfed and storm-battered trees. Above this the summit of the Rockies spreads out under the very sky into a moorland—a grassy Arctic prairie. Here, in places, big snowdrifts lie throughout the summer. To these timberline drifts, when fringed with flowers, the mother and the cubs sometimes came. The stains of their tracks upon the snow showed that the cubs sometimes rolled and scampered over the wasting drifts. They often waded in beaver ponds, swam in the clear lakes, played along the summit of ridges while the mother was making a living; and they often paused, too, listening to the sounds of the winds and waters in the cañons or looking down into the open meadows far below.

Stories of this large, handsome, nearly white Echo Mountain grizzly reached trappers more than one hundred miles away. During the several years through which I kept track of her a number of trappers tried for the bear, each with his own peculiar devices. They quickly gave it up, for in each case the bear early discovered the trap—came close to it and then avoided it.

But finally an experienced old trapper went into her territory and announced in advance his determination to stay until he got the Echo Mountain grizzly. He set a steel trap in the

head of a little ravine and placed a cake of half-burned, highly scented honey just beyond the trap. The mother and the cubs came, and apparently she had had a hard time making them sit down and wait until she examined the trap. To the amazement of the trapper she had climbed down the precipitous rocks behind the trap and procured the honey without passing over the trap.

Knowing that she was in the lower part of her territory, he one day set three large traps in three narrow places on the trail which she used in retreating up the mountain. The uppermost of these he set in the edge of the little lake at the point where she invariably came out of the water in crossing it. He then circled and came below her. Away she retreated. The first trap was detected two or three leaps before she reached it. Turning aside, she at once proceeded to the summit of the range over a new route. The following day the trapper was seen moving his outfit to other scenes.

Two near-by ranchers tried to get the bear by hunting. The latter part of September they invaded her territory with dogs. The second day out the dogs picked up her trail. She fled with the yearling cubs toward the summit of the range over a route with which she was familiar. Pausing at a rugged place she

defied the dogs for a time, the cubs meanwhile keeping on the move. She continued her retreat at a surprising speed for a three-legged bear. The thin snow covering indicated that she ran at something of a gallop, making long, lunging leaps.

About a mile beyond her first affray with the dogs the mother swam with the cubs across a small mountain lake and paused in the willows on the farther shore. Two of the dogs swam boldly after them. Just before they reached the farther shore this daring mother turned back to meet them and succeeded in killing both. One of the other dogs had made his way round the lake and audaciously charged the cubs in the willows. They severely injured him but he made his escape. On went the bears. The hunters reached the lake and abandoned pursuit.

The next year another hunt with hounds was launched. There were a dozen or more dogs. The cubs, now more than two years old, were still with the mother. The hounds started them on the slope of Echo Mountain. They at once headed for the heights. After a run of three or four miles they struck their old route, retreated as before, and again swam the lake, but continued their way on up the range.

At timberline there were clusters of thickly

matted, low-growing trees with open spaces between. Closely pressed, the bears made a stand. Unfamiliar with timberline trees, two of the dogs in dodging the bears leaped into the matted growths. With feet half entangled they were caught by the bears before they could make the second quick move. The mother bear killed one dog with a single stroke of her forepaw and the cubs wrecked the other. The mother and cubs then charged so furiously that the remaining dogs retreated a short distance. Mother and cubs turned and again fled up the slope.

The hounds were encouraged by the near-coming men again to take up pursuit. It was nearly night when the bears made another stand on the summit, where they beat off the dogs before the hunters came up. They then made their way down ledges so rocky and precipitous that the dogs hesitated to follow. Descending two thousand feet into the forest of Wild Basin on the other side of the range, they escaped. Evidently the mother grizzly had planned this line of retreat in advance.

About a month later I saw the Echo Mountain grizzly on the western side of the range, in her home territory. She was ever alert—stopping, looking, listening, and scenting frequently. Often she stood up the better to catch the wireless scent messages. Though vigilant, she was not

worried. She was even inclined to play. While standing on her hind feet she struck at a passing grasshopper with her one forepaw, but she missed. Instantly, while still standing, she struck playfully this way and that, wheeling entirely about as she struck the last time.

From her tracks I noticed that she had been ranging over the middle and lower slopes of her territory, eating elderberries and chokecherries below and kinnikinick and wintergreen berries in the higher slopes. Once, when I saw her rise up suddenly near me, there were elder bush tops with red berries dangling from them in her mouth. After a brief pause she went on with her feast. Having only one forefoot, she was evidently greatly handicapped in all digging operations and also in the tearing to pieces of logs. Bears frequently dig out mice and small mammals and overturn rotten logs and rip them open for the ants and grubs which they contain.

The last year that I had news concerning the Echo Mountain grizzly she was seen with two young cubs on the shore of a beaver pond a few miles southwest of Grand Lake. Berry pickers saw her a few times on Echo Mountain and her tracks were frequently seen.

In the autumn a Grand Lake hunter went out to look for the Echo Mountain grizzly. He had a contempt for any man who pursued

big game with dogs and was sarcastic in his condemnation of the two sets of hunters who had failed with dogs to procure a three-legged bear. He condemned everyone who used a trap. But the skill of this grizzly in escaping her pursuers had gone forth, and being a bear hunter he had a great desire to procure her.

He took a pack horse and several days' provisions and camped in the heart of her territory. He spent two days getting acquainted with her domain and on the third day, shortly after noon, came upon her trail and that of her cubs descending to the lower part of her territory. He trailed for several miles and then went into camp for the night. Early the next day he set off again. He was a painstaking and intelligent stalker and succeeded in approaching at close range to where the bears were eating the tops off raspberry bushes. They either saw or scented him and, as he circled to get closer, retreated. They went down the mountain about two miles, using the trail they had tracked in the snow climbing up.

But in a ravine below they abruptly left their old trail, turned southward, climbed to the summit of a ridge, and travelled eastward, evidently bound for the summit of the range. The hunter also hurried up a ridge toward the top, his plan being to intercept the bears at a point above the

limits of tree growth, where the ridge he was on united with the ridge to which the bears had retreated. He travelled at utmost speed.

Just before he reached the desired point he looked across a ravine and down upon the summit of the parallel ridge. Sure enough, there were the bears! The cubs were leading, the mother bear limping along, acting as rear guard. Apparently she had injured her remaining forefoot. She climbed a small rock ledge to the summit, stood up on hind feet and looked long and carefully back down the ridge along which they had just travelled. While she was doing this the cubs were playing among the scattered trees. The mother grizzly rejoined the cubs and urged them on before her along the ridge. At every opportune place she turned to look back.

The wind was blowing up the slope. The hunter had hidden in a rock ledge just above the treeline and was thus awaiting the bears where they could neither see nor scent him.

Presently they emerged from among the storm-dwarfed and battered trees out upon the treeless mountain-top moorland. Up the slope they started along a dim, wild life trail that passed within an easy stone toss of the hunter. The mother, limping badly, finally stopped. The cubs stopped, looked at her, then at each other, and began to play.

The mother rose on her hind feet. Instantly the cubs stopped playing and stood up, looking silently, seriously at the mother, then at every point toward which she gazed. Looking down the slope she sniffed and sniffed the air.

Holding the only remaining and crushed forepaw before her she looked it over intently. It was bleeding and one toe—nearly severed—hung loosely. The paw appeared to have been crushed by a falling rock. With the cubs watching her as she licked the wounded foot, the hunter made ready and drew bead just below the ear.

The shadow of a passing cloud rushed along the earth and caused the cubs to cease their serious watching of their mother and to follow with wondering eyes the ragged-edged shadow skating up the slope. The hunter, close enough to see the blood dripping from the paw, shifted slightly and aimed for the heart. Then, as he flung his rifle at a boulder: "I'll be darned if I'll kill a crippled mother bear!"

THE END

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